IDENTIFICATION AND PREDICTION OF CHILD BEHAVIOR TRAJECTORIES AMONG CHILDREN WHO HAVE EXPERIENCED MALTREATMENT

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ABSTRACT

Background. Child maltreatment affects almost 683,000 children annually. The consequences of child maltreatment range from physical and mental health issues, at the micro-level, to increased child welfare worker caseloads and overcrowded residential facilities at the mezzo-level, to increased costs and policy implications at the macro-level. Children who have been maltreated are at-risk for behavioral problems, yet little is known about the diverse problematic behaviors of these children or main factors causing behaviors. This study aims to identify internalizing and externalizing behavior pathways that follow over a 6-year period, and the predictors of membership in problematic pathways.

Methods. Growth Mixture Modeling (GMM) was used to estimate the number of subgroups of children following distinct behavioral pathways. Standard T-scores from the CBCL subscales were entered into a series of unconditional GMM models. BIC, BLRT, and entropy were examined when considering model fit. Multinomial logistic regression was conducted to identify predictors of problematic behaviors over time.

Results. There were no unconditional models that fit the data best. Several statistically significant ($p < 0.05$) factors at the level of the child, caregiver/parent, and environmental influence children's problematic behaviors. Controlling for all other model variables constant, male children are more likely to exhibit behavioral problems than female children. Children with low social skills are more likely to engage in problematic behaviors. Caregivers with little or no support are more likely to report having children engaged in delinquent behavior. Finally, access to social services significantly lowers the children's problematic behavior over time.

Conclusions. Children differ regarding how they respond to maltreatment and other life events or situations depending upon child, caregiver, and environmental factors. Study results indicated

that these factors influence the problematic behaviors of maltreated children. Study results also indicated that improving maltreated children's social skills and increasing caregiver social support may be key in reducing child behavior problems. Furthermore, identifying early indicators of internalizing and externalizing behavior problems and addressing them with evidence-based interventions to reduce negative behaviors may avert long-term negative outcomes. Limitations of this current study are reviewed; practice and policy implications are discussed as are recommendations for future research.

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Chapter 1. Introduction: Child Maltreatment

Introduction and Problem Description

Child maltreatment is a complex and prevalent problem impacting children and families across the United States and around the world (Runyan, Wattam, Ikeda, Hassan, & Ramiro, 2002; Schroeder, Karczewski, & Fowler, 2012; Stith et al., 2009). It takes on numerous forms, including physical abuse, psychological abuse, sexual abuse, and neglect (failure to provide basic physical, health care, supervision, nutrition, emotional, education and/or safe housing needs). Substantial documentation exists in the scientific literature of the association between child maltreatment and a broad range of emotional, behavioral, and physical health problems (Child Welfare Information Gateway, 2013b).

For the year 2015, a nationally estimated 683,000 children were counted as "unique" victims of child maltreatment in the United States, with "unique" meaning that the child was reported sometime throughout the year as being maltreated. This definition is different from previous years in which "duplicates" were counted, which meant that children were counted each time they experienced some form of maltreatment during the year (U.S. Department of Health and Human Services, 2017). A victim is defined as a child for whom the state determined at least one maltreatment was substantiated or indicated, or the child received a disposition of alternative response victim. This includes a child who died of child abuse and neglect. More specifically, 514,299 (75.3%) children experienced neglect, 117,476 (17.2%) suffered physical abuse, 57,372 (8.4%) experienced sexual abuse, and 47,127 (6.9%) experienced such “other” types of maltreatment as threatened abuse, parent’s drug/alcohol abuse, or safe relinquishment of a newborn (U.S. Department of Health and Human Services, 2017). Whereas this number has declined over the last few years, the mortality rate of children who have been maltreated

continues to increase from 1,413 (1.94%) in 2005 to 1,585 (2.25%) in 2015. The majority or 74.8% of those children who have died were under the age of 3 and 72.9% died as a result of neglect alone or a combination of neglect and another maltreatment type (U.S. Department of Health and Human Services, 2017).

The figures and numbers mentioned from the previous paragraph are hard to establish because many of the child maltreatment cases are not routinely investigated and follow up examinations are not carried out. The actual or precise numbers are probably higher than what was presented on the reports (Murphy, 2012). Many cases have gone unheard and unsolved because adults don't always report child maltreatment. Indeed, this problem offers social work researchers an opportunity to find solutions to minimize or eventually eliminate completely the problem of child maltreatment.

Child Maltreatment as a Social Problem

Considerable evidence exists in scientific studies of the association between child maltreatment and a broad range of physical, behavioral, and emotional health issues. These effects may vary depending on the age of the child when victimized, the co-occurrence with other maltreatment types and/or adverse exposures such as the mental health of the parents, substance abuse by the parents, or violence between parents, and the duration and severity of the abuse or neglect (Caspi et al., 2002; Chalk, Gibbons, & Scarupa, 2002). Emotional and behavioral problems associated with child maltreatment are aggression, conduct disorder, antisocial behavior, delinquency (Gold, Sullivan, & Lewis, 2011), substance abuse (Felitti & Anda, 2009), teenage pregnancy (Anda et al., 2002), intimate partner violence (Dube, Anda, Felitti, Edwards, & Williamson, 2002), anxiety, posttraumatic stress disorder, depression, and suicide (Chapman et al., 2004; Putnam, 2003). Child maltreatment and other hostile exposures

also have been directly linked to long term outcomes such as poor adult health status; particular health problems such as diabetes, ischemic heart disease, and sexually transmitted infections; and many health risk behaviors including smoking and obesity (Felitti & Anda, 2009; Gilbert et al., 2009; Shin & Miller, 2012). Furthermore, exposure to child maltreatment can have adverse effects on cognitive development, including language deficits and reduced cognitive functioning (National Scientific Council on the Developing Child, 2012; Tarullo, 2012). One mechanism for these consequences is the harmful impact that chronic or recurrent exposure to stress, such as that caused by child maltreatment, can have on the inter-related brain circuits and hormonal systems that regulate stress (e.g., sympathetic adrenomedullary system, hypothalamic-pituitary-adrenocortical system) (McCrory, De Brito, & Viding, 2010; National Scientific Council on the Developing Child, 2005; Shonkoff et al., 2012). These brain systems are particularly malleable during early childhood, a time of heightened risk for severe injury (National Scientific Council on the Developing Child, 2005). Alterations in these brain systems can cause a premature physiological aging of the body that increases vulnerability to mental and physical health problems (Corso, Edwards, Fang, & Mercy, 2008).

Child maltreatment remains a public health problem. There are many cases not being reported to police or social services and only few cases of abuse and neglect have been reported in the news. According to the U.S. Department of Health and Human Services (2015), over 1,520 children died in the United States in 2013 from abuse and neglect, 679,000 children were found to be victims of maltreatment by child protective services in 2013, and the total lifetime economic burden resulting from these new cases of fatal and nonfatal child maltreatment in the United States is approximately $124 billion (Fang, Brown, Florence, & Mercy, 2012a; U.S. Department of Health and Human Services, 2015, 2017).

Effects and Consequences of Child Maltreatment

The impact of child abuse and neglect is often discussed in terms of physical, psychological, behavioral, and societal consequences (Child Welfare Information Gateway, 2013a). However, it is impossible to separate the types of impacts. Physical consequences, such as damage to a child's growing brain, can have psychological implications, such as cognitive delays or emotional difficulties. Psychological problems often manifest as high-risk behaviors or problematic symptoms (depression, anxiety, withdrawn, and being antisocial). Depression and anxiety, for example, may make a person more likely to smoke, abuse alcohol or drugs, engage in risky sexual activity, or overeat. Abused children may also manifest externalizing behaviors such as being aggressive, delinquent, and impulsive. High-risk behaviors, in turn, can lead to long-term physical health problems, such as sexually transmitted diseases, cancer, and obesity. Although not all children who have been abused or neglected will experience long- term consequences, their susceptibility to long-term effects will likely increase (Child Welfare Information Gateway, 2013a).

Physical Health Consequences. The immediate physical effects of abuse or neglect can be relatively minor (bruises or cuts) or severe (broken bones, hemorrhage, or even death). In some cases, the physical effects are temporary; however, the pain and suffering they cause a child should not be discounted (Child Welfare Information Gateway, 2013a).

Child abuse and neglect can have a multitude of long-term effects on physical health. National Survey of Child and Adolescent Well Being (NSCAW, 2014) researchers found that, at some point during the three years following a maltreatment investigation, 28 percent of children had a chronic health condition (U.S. Department of Health and Human Services, 2007). The adverse effects of physical abuse on children have long-term consequences on the emotional

health of the child as well. The relationship between the child and their parents could be strained by the physical abuse and neglect. The level of trust with their close relationships will be affected and will even linger on after the physical effects have healed (Child Welfare Information Gateway, 2013a). Below are additional long-term effects reflected in the literature.

Abusive head trauma. Abusive head trauma, an inflicted injury to the head and its contents caused by shaking and blunt impact, is the most common cause of traumatic death for infants (Glaser, 2014; Tarullo, 2012). The injuries may not be immediately noticeable and may include bleeding in the eye or brain and damage to the spinal cord and neck (Tarullo, 2012). Significant brain development takes place during infancy, and this important development is compromised in maltreated children. One in every four victims of shaken baby syndrome dies, and nearly all victims experience serious health consequences (U.S. Centers for Disease Control and Prevention, 2012). We also know that some cases of physical abuse can cause immediate direct structural damage to a child's brain. For example, according to the National Center on Shaken Baby Syndrome (n.d.), shaking a child can destroy brain tissue and tear blood vessels. In the short-term, this can lead to seizures, loss of consciousness, or even death. In the long term, shaking can damage the fragile brain so that a child develops a range of sensory impairments, as well as cognitive, learning, and behavioral disabilities (National Center on Shaken Baby Syndrome, n.d.).

Impaired brain development. Child abuse and neglect have been shown to cause important regions of the brain to fail to form or grow properly, resulting in impaired development. These alterations in brain maturation have long-term consequences for cognitive, language, and academic abilities and are connected with mental health disorders (Tarullo, 2012). Disrupted neurodevelopment as a result of maltreatment can cause children to adopt a persistent

fear state as well as attributes that are normally helpful during threatening moments but counterproductive in the absence of threats, such as hyper-vigilance, anxiety, and behavior impulsivity (Perry, 2012; Shonkoff et al., 2012).

Poor physical health. Several studies have shown a relationship between various forms of child maltreatment and poor health. Adults who experienced abuse or neglect during childhood are more likely to suffer from cardiovascular disease, lung and liver disease, hypertension, diabetes, asthma, and obesity (Felitti & Anda, 2009). Specific physical health conditions are also connected to maltreatment type. One study showed that children who experienced neglect were at increased risk for diabetes and poorer lung functioning, while physical abuse was shown to increase the risk for diabetes and malnutrition (Widom, Czaja, Bentley, & Johnson, 2012). Additionally, child maltreatment has been shown to increase adolescent obesity. A longitudinal study found that children who experienced neglect had body mass indexes that grew at significantly faster rates compared to children who had not experienced neglect (Shin & Miller, 2012).

Psychological Consequences. The immediate emotional effects of abuse and neglect—isolation, fear, and impaired trust—can translate into lifelong psychological consequences, including low self-esteem, depression, and relationship difficulties. Researchers have identified links between child abuse and neglect and the following:

Difficulties during infancy. Of children entering foster care in 2010, 16 percent were younger than 1 year. When infants and young children enter out-of-home care due to abuse or neglect, the sudden loss of their primary caregiver(s) may be experienced as traumatic and negatively impact their ability to form secure attachment bonds to future caregivers (U.S. Department of Health and Human Services, 2012a). Infants have a genetic predisposition to form

secure attachments to their primary caregivers, but they may not be able to develop secure attachments bonds, or trusting, durable bonds if they are in a severely abusive and neglectful situation and with little one-on-one responsive, attuned caregiver interaction (Child Welfare Information Gateway, 2015). Nearly half of infants in foster care who have experienced maltreatment exhibit some form of cognitive delay and have lower IQ scores, language difficulties, and neonatal challenges compared to children who have not been abused or neglected (Zero To Three, 2011).

Poor mental and emotional health. Experiencing childhood trauma and adversity, such as physical or sexual abuse, is a risk factor for borderline personality disorder, depression, anxiety, and other psychiatric disorders (Child Welfare Information Gateway, 2013a). One study using ACE data found that roughly 54 percent of cases of depression and 58 percent of suicide attempts in women were connected to adverse childhood experiences (Felitti & Anda, 2009). Child maltreatment also negatively impacts the development of emotion regulation, which often persists into adolescence or adulthood (Messman-Moore, Walsh, & DiLillo, 2010)

Cognitive difficulties. NSCAW researchers found that children with substantiated reports of maltreatment were at risk for severe developmental and cognitive problems, including grade repetition (U.S. Department of Health and Human Services, 2012b). In the final report on the second NSCAW study (NSCAW II), more than 10 percent of maltreated school-aged children and youth showed some risk of cognitive problems or low academic achievement, 43 percent had emotional or behavioral problems, and 13 percent had both (Casanueva, Ringeisen, Wilson, Smith, & Dolan, 2011). Some studies on adolescents and adults who were severely neglected as children indicate that they have a smaller prefrontal cortex, which is critical to behavior, cognition, and emotion regulation (National Scientific Council on the Developing Child, 2012).

Executive functioning skills help people achieve academic and career success, bolster social interactions, and assist in everyday activities (Child Welfare Information Gateway, 2015). The structural and neurochemical damage caused by maltreatment can create deficits in all areas of executive functioning, even at an early age (Hostinar, Stellern, Schaefer, Carlson, & Gunnar, 2012; National Scientific Council on the Developing Child, 2011). The brain alterations caused by a toxic stress response can result in lower academic achievement, intellectual impairment, decreased IQ, and weakened ability to maintain attention (K. R. Wilson, Hansen, & Li, 2011).

Social difficulties. Children who experience neglect are more likely to develop antisocial traits as they grow up. Parental neglect is associated with borderline personality disorders, attachment issues or affectionate behaviors with unknown/little-known people, inappropriate modeling of adult behavior, and aggression (Child Welfare Information Gateway, 2015; Perry, 2012). Child maltreatment can alter brain development in ways that make interaction with others more difficult (Child Welfare Information Gateway, 2015). Children or youth who experienced maltreatment find it more challenging to navigate social situations and adapt to changing social contexts (Hanson et al., 2010). Children may perceive threats in safe situations more frequently and react accordingly, and they may have difficulty interacting with others (National Scientific Council on the Developing Child, 2010b). For example, a maltreated child may misinterpret a peer's neutral facial expression as anger, which may cause the maltreated child to become aggressive or overly defensive toward the peer.

Behavioral Consequences. Not all victims of child abuse and neglect will experience behavioral consequences. However, behavioral problems appear to be more likely in this group when compared to their non-maltreated peers. According to NSCAW, more than half of youth reported for maltreatment are at risk for behavioral problems (U.S. Department of Health and

Human Services, 2012b). Child abuse and neglect can have many potential behavioral consequences. A meta-analysis examining this relationship found that physical abuse and neglect are associated with a doubling of the odds of childhood behavioral and conduct disorders (Norman et al., 2012). Below are examples of behavioral outcomes:

Difficulties during adolescence. NSCAW data show that more than half of adolescent youth with reports of maltreatment are at risk of grade repetition, substance abuse, delinquency, truancy, or pregnancy (U.S. Department of Health and Human Services, 2012b). Other studies suggest that abused or neglected children are more likely to engage in sexual risk-taking as they reach adolescence, thereby increasing their chances of contracting a sexually transmitted disease (Evans-Campbell, Lindhorst, Huang, & Walters, 2006; H. W. Wilson & Widom, 2011). Victims of child sexual abuse also are at a higher risk for rape in adulthood; in fact, their relative risk increases according to the severity of the child sexual abuse experience(s) (Felitti & Anda, 2009; Messman-Moore et al., 2010)

Juvenile delinquency and adult criminality. Several studies have documented the correlation between child abuse and future juvenile delinquency. Children who have experienced abuse are nine times more likely to become involved in criminal activities compared to their non-abused peers (Gold et al., 2011; McLaughlin et al., 2010; Root, MacKay, Henderson, Del Bove, & Warling, 2008). McLaughlin and colleagues (2010) documented the association of child maltreatment to disruptive behavior.

Alcohol and other drug abuse**.** Research consistently reflects an increased likelihood that children who have experienced abuse or neglect will smoke cigarettes, abuse alcohol, or take illicit drugs during their lifetime (Anderson & Libby, 2011; Leslie et al., 2010). In fact, male children with an ACE Score of six or more (having six or more adverse childhood experiences)

had an increased likelihood of more than 4,000 percent of intravenous drug use later in life (Felitti & Anda, 2009). Other researchers found a relationship between child maltreatment and adolescent binge drinking (Shin, Edwards, & Heeren, 2009).

***Abusive behavior*.** Several studies identified relationships between multiple types of adverse events and distinct categories of adolescent violence perpetration (Duke, Pettingell, McMorris, & Borowsky, 2010; Yates, Carlson, & Egeland, 2008). Duke and colleagues (2010) particular study identified that adverse childhood experience was significantly associated with adolescent interpersonal violence perpetration (delinquency, bullying, physical fighting, dating violence, weapon-carrying on school property) and self-directed violence (self-mutilatory behavior, suicidal ideation, and suicide ideation).

Societal Consequences. Whereas child abuse and neglect usually occur within the family, the impact does not end there. Society as a whole pays a price for child abuse and neglect, in terms of both direct and indirect costs.

***Direct costs*.** The lifetime cost of child maltreatment and related fatalities in 1 (one) year totals $124 billion CDC (Child Welfare Information Gateway, 2015; Fang, Brown, Florence, & Mercy, 2012b; U.S. Centers for Disease Control and Prevention, 2012; U.S. Department of Health and Human Services, 2015). Child maltreatment is more costly on an annual basis than the two leading health concerns, stroke and type 2 diabetes (Fang et al., 2012a). On the other hand, programs that prevent maltreatment have shown to be cost effective. The U.S. Triple P System Trial, funded by the CDC, has a benefit/cost ratio of $47 in benefits to society for every $1 in program costs (Saul et al., 2014). The Triple P System is a public health approach to reach all parents of children aged zero to 16 years old in a community to enhance parental competence

and prevent or alter dysfunctional parenting practices, thereby reducing family risk factors both for child maltreatment and for children's behavioral and emotional problems.

Indirect costs. Indirect costs represent the long-term economic consequences to society because of child abuse and neglect. These include costs associated with increased use of our health-care system, juvenile and adult criminal activity, mental illness, substance abuse, and domestic violence. A national non-profit organization estimates that child abuse and neglect prevention strategies can save taxpayers $104 billion each year (Prevent Child Abuse America, 2013). According to the Schuyler Center for Analysis and Advocacy (2011), every $1 spent on home visiting yields a $5.70 return on investment in New York, including reduced confirmed reports of abuse, reduced family enrollment in Temporary Assistance for Needy Families, decreased visits to emergency rooms, decreased arrest rates for mothers, and increased monthly earnings (Schuyler Center for Analysis and Advocacy, 2011). Anda and colleagues (2004) found that all eight categories of adverse childhood experiences were associated with an increased likelihood of employment problems, financial problems, and absenteeism. These long-term costs—to the workforce and to society—are preventable (Anda et al., 2004).

Child welfare policy has continued to swing on a pendulum since the first identified case of child maltreatment. Politicians and citizens alike have struggled with defining child maltreatment and the states' role in protecting the child versus upholding parental autonomy. This has been reflected in the movement from immediate removal to family preservation to community intervention. As more and more individuals are beginning to realize that maltreatment prevention cannot be solely achieved on the individual level, community intervention is becoming paramount. This is evident in President Obama's Strengthening Communities initiative, which has led to the Strengthening Families and Communities initiative

to eradicate child maltreatment by the Children's Bureau (U.S. Department of Health and Human Services, 2011).

The Strengthening Families and Communities resource guide was developed in response to President Obama's Strengthening Communities initiative. The resource guide aims to assist communities in prevention measures to protect children from child maltreatment. It is based on five identified protective factors (e.g., nurturing and attachment, knowledge of parenting and of child and youth development, parental resilience, social connections, and concrete supports to parents) that have been discussed throughout this first chapter. This resource guide is the culmination of decades of research and policy changes in the United States on child maltreatment. It includes information related to how to work with families to build on the five protective factors, how to engage communities to tap into resources and build community awareness, how to protect children from maltreatment including reporting of child maltreatment, resources for parents and practitioners, and tip sheets for parents are written from a strengths-based perspective (U.S. Department of Health and Human Services, 2011). This is the foundation of child maltreatment prevention today and another step in the right direction for the prevention of child maltreatment in the United States.

Relevance for Social Work and Child Welfare

Social Work professionals are in a position to promote nurturing, stable relationships in addition to protecting children from harm. Identifying the parents and children most in need of intervention and providing early intervention services at one of the most critical stages of child development has the potential to impact positive development while averting negative short and long-term outcomes. As a field, if we seize the opportunity to help parents provide more nurturing and responsive care and prevent child maltreatment, we have the potential to influence

the early development and set young children on a positive, healthy developmental trajectory. To help influence positive development, we must understand whether or not child welfare services have an impact on child development.

Social Work practitioners working with young children investigated by child protective services also need to know what factors predict poor developmental outcomes to help identify essential needs and services to incorporate into the child welfare case plan (i.e., Individualized Family Service Plan; IFSP) and, when applicable, to advocate for the receipt of early intervention or special education services, to avert negative outcomes and promote positive ones. Understanding the early risk factors and finding ways to identify them and offer adequate treatment has the potential to alter developmental trajectories to improve outcomes for children.

Policy makers and intervention planners need more information about the prevalence of problematic developmental trajectories and the factors associated with problematic and positive paths as they allot funds for high-risk groups of children and their parents in need of services. Further, to fund and implement for the most effective services, policy makers and practitioners alike need to understand the impact of child welfare services on the development of children who come to the attention of child welfare agencies. With more than 683,000 children identified as victims of child maltreatment in 2015 (U.S. Department of Health and Human Services, 2017), it is critical to determine the children at greatest risk of developmental problems and take action to encourage optimal development and avert the long-term consequences associated with early risk and delays.

Aims and Objectives of the Current Dissertation

As established earlier, maltreatment impacts the behavioral development of the abused child. Fortunately, not all victims of child abuse and neglect will experience behavioral consequences. However, behavioral problems appear to be more likely in this group compared to their non-maltreated peers. Studies show that some child characteristics (Maschi, Morgen, Bradley, & Hatcher, 2008; Postlethwait, Barth, & Guo, 2010; Whitney, Renner, & Herrenkohl, 2010), parent/caregiver characteristics (Kohl, Kagotho, & Dixon, 2011; Scarborough & McCrae, 2010; van Aken, Junger, Verhoeven, van Aken, & Deković, 2008), and factors in the broader caregiving environment are related to child internalizing and externalizing behaviors (Barth, Wildfire, & Green, 2006; Duva & Mertzger, 2010). The emerging literature examining person-centered behavior trajectories among young children provides further evidence that several of these factors predict persistent high levels of behavior problems, including young maternal age (Shaw, Gilliom, Ingoldsby, & Nagin, 2003; Tremblay et al., 2004; Woodruff, 2012). Given that abused children are at high risk for behavior problems, it is critical to understand the impact of factors as mentioned above to the behavioral development.

The purpose of this study is to explore the behavioral pathways (trajectories) of children investigated for maltreatment and to identify predictors of normal and problematic developmental trajectories. Identification of the possible factors associated with child behavioral problems can provide valuable information for assisting professionals in identifying children at risk for persistent externalizing and internalizing behavioral problems. This study will inform practitioners of the different factors specifically associated with child behavioral problems. The Bronfenbrenner's ecological model of human development—adapted from Urie

Bronfenbrenner's 1979 ecological systems model (Bronfenbrenner, 2005), is presented in the next chapter to provide a theoretical framework for exploration of the research questions.

Child maltreatment remains a substantial threat to children's well-being and healthy development. Although many researchers know much about the risk factors related to child problematic behaviors, however, relatively little is known about the manner in which combinations of risk factors contribute to internalizing and externalizing child behavioral problems (Murphy, 2012; Woodruff & Lee, 2011b). This study is guided by the idea that multiple risk factors from various social ecological levels impact significantly the well-being of the child. Multiple factors also contribute also to the healthy development of the child. These factors exist within nested social ecological structures, requiring a more comprehensive analysis; as such, this study offers a unique and important contribution to the literature on factors affecting well-being among children who have been abused and neglected. Furthermore, there have been no national studies examining the behavioral trajectories of maltreated children utilizing multilevel predictors.

For this dissertation, growth mixture modeling (GMM) was used to explore the distinct developmental pathways of these high-risk children without imposing classification of the children into pre-defined groups prior to the analysis (see Method in Chapter 3 for more information). Once the distinct pathways were identified, the predictors of the problematic and normal trajectories were modeled. The specific aims of the dissertation are outlined below.

Aim 1: Identify the number, shape, and size of subgroups of maltreated children following distinct behavioral trajectories. The first aim of the study was to identify the number and shape of distinct behavioral trajectories that maltreated children follow over a period of five or six years after investigation for child neglect, and to estimate the proportion of children in

each subgroup. Two developmental outcomes – internalizing behaviors and externalizing behaviors – were examined independently, followed by exploration of co-occurring normal and problematic developmental paths for these indicators.

Aim 2: Describe the characteristics of children in distinct trajectory groups. Once the trajectory groups were identified for each developmental outcome, the characteristics of children in each group were described, including significant differences across the trajectory groups

Aim 3: Understand which factors in the caregiving environment predict membership in the behavior trajectory groups. In addition, theoretically relevant variables were tested to identify which factors in the caregiving environment predict membership in the developmental trajectory groups in a multivariate model (one for each developmental outcome).

Chapter 2: Theoretical Background and Literature Review: Development of Maltreated Children

This chapter provides an overview of the social bioecological model of human development and the literature regarding the relationship between characteristics of the child and caregiving environment and the behavioral pathways of maltreated children. Research questions are presented at the end of the chapter, organized by study aims.

Conceptual Framework

In this section, a bioecological approach (Bronfenbrenner, 2005) will be explained and explored as basis for analysis of the child maltreatment data presented for this study. By the end of 1980 decade and into the 1990s, Bronfenbrenner indicated that he was not pleased by the nature of his contribution to either theory, research, or policy applications pertinent to enhancing the ecology of the child's life to promote his or her positive development (Bronfenbrenner, 2005). He recognized that his theory would be incomplete until he included in it the levels of individual structure and function (biology, psychology, and behavior) fused dynamically with the ecological systems he described from his early works.

Bioecological Model of Human Development. For this study, a bioecological model is mainly well fitting to problems like the consequences of child maltreatment that are dictated by the interplay of micro-, mezzo-, and macro-level factors (Garbarino, 2005). Urie Bronfenbrenner developed the Bioecological Model in 2005. This Bioecological Model focuses on the impact that environment – in addition to biology—has on an individual's development. Bronfenbrenner understood that the surrounding environment affected individuals. There is a definite interaction that occurs between a person and his or her environment that impacts behavior, but as of yet, it had not been modeled or generally accepted at the time Bronfenbrenner was still developing the

model. Bronfenbrenner set out to not only conceptually model his idea, but also to empirically validate it. He argued that the ecological environment is conceived as a set of nested structures, each inside the next, like a set of Russian dolls. As it relates to child maltreatment, it is clear that children are nested within families that are nested within environments (e.g., neighborhoods, counties, schools). Thus, a careful examination of Bronfenbrenner's Bioecological System Model is necessary to understand the interplay of individual, family, and environmental factors as it relates to the child's problematic behavior.

Development from Bronfenbrenner's Perspective. Before examining the systems in which an individual develops, it is important to define development from Bronfenbrenner's perspective. According to Bronfenbrenner, "development is defined as the person's evolving conception of the ecological environment and his relation to it, as well as the person's growing capacity to discover, sustain, or alter its properties" (Bronfenbrenner, 1979, p. 9). From this definition, one can see that an individual's perception of their environment can change over time; it is not stagnant. Additionally, not only must one consider how an individual perceives his or her environment, but also how that individual interacts with his or her environment. Lastly, and maybe most importantly, is the idea that an individual has the potential to not only discern what makes up his or her environment but also can change the environment.

Bronfenbrenner (2005) hypothesized that individual human development is influenced by the individual's interaction with their environment. However, not only is the actual environment in which an individual lives important, but the individual's perception of their environment also impacts human development and behavior (Bronfenbrenner, 2005). For example, an individual may live in a community in which there is relatively little crime; however, if that individual perceives his or her community to be unsafe, his or her behavior is going to be a result of

perception rather than reality, or empirical evidence. Similarly, residing in an unsafe neighborhood will also impact human development and behavior.

The Bioecological Model constitutes a process-person-context-time (PPCT) model (see Figure 1). The four components of the model includes: The model that has emerged from this scholarship has four interrelated components: (a) the developmental process, involving the fused and dynamic relation of the individual and the context; (b) the person, with his or her individual repertoire of biological, cognitive, emotional, and behavioral characteristics; (c) the context of human development, conceptualized as the nested levels, or systems, of human development he has depicted (Bronfenbrenner, 1979); and (d) time, conceptualized as involving the multiple dimensions of temporality—constituting the chronosystem that moderates changes across the life course (Bronfenbrenner, 2005).

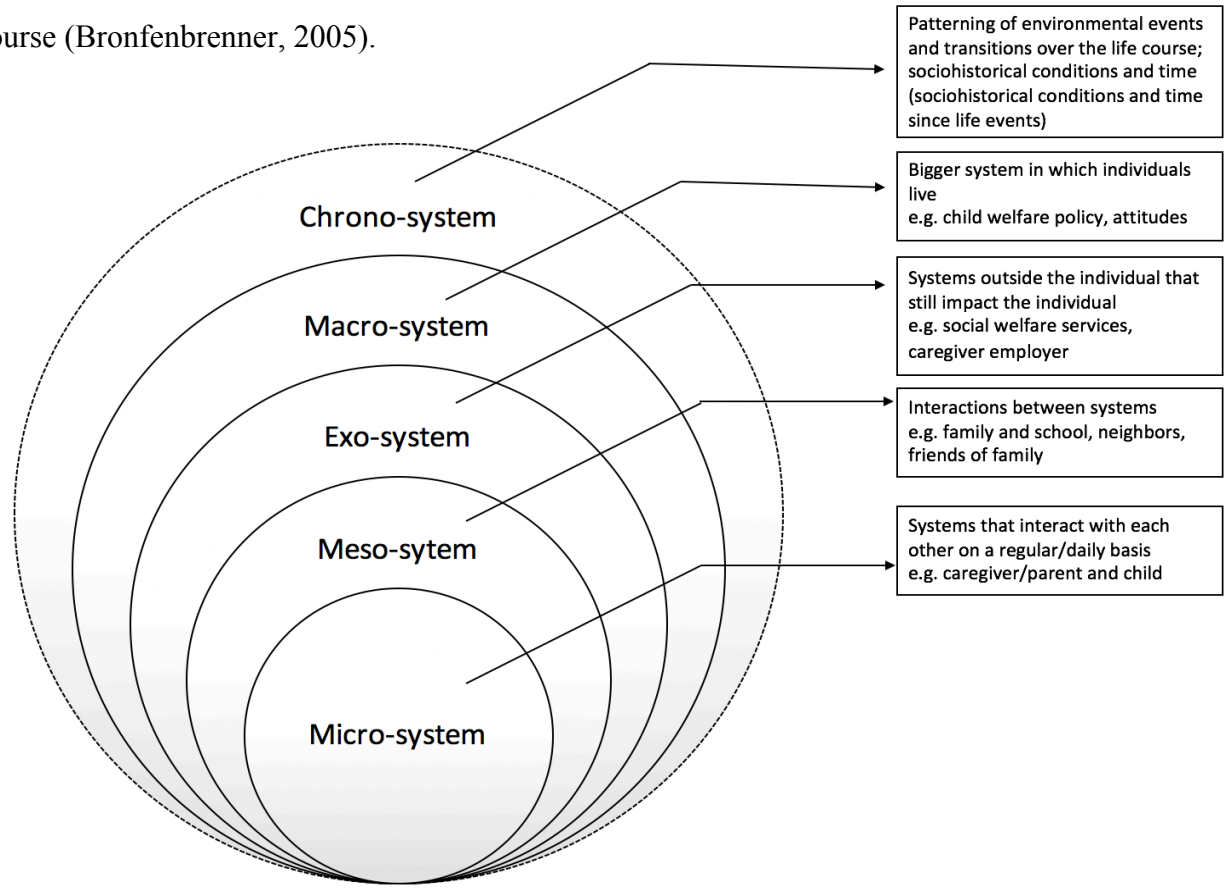


Figure 1. Bronfenbrenner's Ecological Model of Human Development

Child maltreatment is a complex social problem that has long-term consequences for children, such as behavioral problems, disrupted social relationships, mental health problems, and difficulties succeeding in school. As children grow from toddlerhood to school-age they typically learn to control their emotional reactions, and their behavior improves (Woodruff & Lee, 2011a). According to maternal reports of child behavior, problematic behaviors on average decline from around age 4 into adolescence (Bongers, H. M. Koot, J. van Der Ende, & F. C. Verhulst, 2003b; M. Keiley, Bates, Dodge, & Pettit, 2000). Even in populations in which behavioral problems are higher on average (e.g. children investigated by child welfare services and children born to teenage mothers) a decline in behavior problems occur over time (McCrae, 2009). Nonetheless, some children exhibit high levels of behavioral problems that remain at the clinical level over time (McCrae, 2009). Children's behavioral path is influenced by the individual child's characteristics and responses to the parent, the parent's characteristics and responsiveness to the child, factors in the broader caregiving environment, and the interaction among all of these over time (Woodruff & Lee, 2011b). In addition to actual maltreatment, however, are other factors that influence children's behavior, which will be reviewed below. These factors may be classified as child factors, caregiver factors, and environmental factors.

Ecological System and Child Maltreatment

According to the social context of child maltreatment, there are factors from an ecological perspective that contribute to child abuse and neglect (Belsky, 1980, 1993; Murphy, 2012). Researchers provided evidence that familial, economic, and cultural factors contributed to the maltreatment (Belsky, 1980, 1993; Murphy, 2012). The development of the child is also influenced by the combination of individual level factors, family and broader caregiving environment, and the interaction between them over time (Algood, Hong, Gourdine, & Williams,

2011; Sameroff, 2009; Sameroff & Fiese, 2000). Also, there is an abundance of research linking economic, cultural, and environmental factors to child abuse and neglect (Mokuau, 2002; Murphy, 2012; Plummer & Njuguna, 2009; Zielinski & Bradshaw, 2006). However, there are also factors (family commitment and social support) that may mediate the occurrence of maltreatment ((Baumrind, 1994). These findings are congruent with the Bronfenbrenner's premise that positive support can reduce the developmental impact of child abuse on a micro-level.

People have different ways of raising their child which sometimes lead to disagreement. One area of great disagreement is spanking. There has been continued debate over whether it is appropriate to spank a child or whether that could be considered maltreatment. While one family may consider it abusive to spank a child, another family may view it as necessary for protective reasons. However, issues such as female circumcision must be addressed even though they are culturally appropriate in some areas across the world, which lead Baumrind (1994) to state that "cultural pluralism mandates understanding, but not unconditional acceptance" (p. 362).

To understand the developmental progress of a child, it is critical to examine child level factors such as biology and behaviors, parent characteristics and parenting behaviors, and other factors in the broader caregiving environment; and to assess how each may influence the other's behavior over time (Woodruff, 2012). The relationship between the child and caregiving environment occur at many levels of the child rearing regulatory system (i.e., between the child, parent, family, and/or cultural level). The strength of influence across levels is not equal, however (Woodruff, 2012). Both parent and child influence the other, but the parent's influence is stronger on the child than the child's is on the parent, especially in the early years of the child's life (Sameroff, 2009). Likewise, Sameroff reported that the effects from the societal level

are stronger on the parent than the parent's influence on society.

Many bioecological interactions encourage positive development, whereas other interactions may hinder development. Developmental achievements result from a chain of events over time and rarely one antecedent. Therefore, the initial conditions faced by a child cannot reliably predict the child's positive or negative outcome. Rather, there are many points in time when factors in this child rearing regulatory system may support or hinder the child's developmental progress (Sameroff & Fiese, 2000). Problems in development occur when there is an accumulation of negative relationships and factors in the child rearing regulatory system.

The bioecological system model supports a comprehensive look at child, parent, family, and societal level factors, and the reciprocal interaction among them, to assess strengths and weaknesses in the child rearing regulatory system for an individual child. With this information, practitioners may provide interventions that target the specific areas of the child's family system that require support, selecting the most appropriate combination of remediation, redefinition, or reeducation, and addressing the level of need (big or small) to alter the child's developmental course. This approach acknowledges that no one factor or ecological level will cause developmental problems. The ecological model offers hope for children at high risk of developmental problems because the model posits they may benefit from intervention at multiple time points and at multiple levels, as needed, to improve their developmental course. Sameroff and Fiese (2000) argue that this complex view of developmental psychopathology is needed because it "matches the complexity of human behavior" (p. 660).

This appropriately complex model is difficult to test in research. Longitudinal research observing details from the child and caregiving environment and their interactions over time are needed. Ideally, research applying the ecological model follows the interactions between the

child and caregiving environment from one moment to the next over an extended period of time (Lunkenheimer, Olson, Hollenstein, Sameroff, & Winter, 2011), but the time and resources necessary to complete such research are considerable. Some strides have been made (see Sameroff, 2009), but much more is to be done. The current dissertation adapts the ecological model to create a simplified, testable model of child development using data from a nationally representative longitudinal study of children involved with child welfare services. The literature to support the conceptual model of child development among young neglected children and the impact of multiple factors on the child's behavior is reviewed below, followed by the conceptual model used in this dissertation.

Typical and Unusual Behavioral Paths of Young Children

The author reviewed published scholarship to understand normative developmental paths in early childhood, explore what is known about the developmental paths of young neglected children, and identify predictors of normative and negative developmental outcomes. The review includes articles regarding child neglect and child development, as well as articles or book chapters that describe empirical studies related to cognitive and behavior outcomes. Recent scholarly texts related to child development were also reviewed.

Relevant studies and texts were identified through a search of online databases and a review of prior NSCAW publications. The search included the following online databases: Google Scholar (Beta; www.scholar.google.com), PsycINFO, Social Sciences Citation Index, and Social Work Abstracts. NSCAW publications were obtained partially through this process and partially through a review of the National Data Archive on Child Abuse and Neglect (NDACAN) web site (http://www.ndacan.cornell.edu/), including NDACAN's child abuse and neglect Digital Library (http://www.ndacan.cornell.edu/Ndacan/Bibliography.html), and

Administration of Children, Youth & Families web site (http://www.acf.hhs.gov/programs/opre/abuse_neglect/nscaw/). Search terms included combinations of the following: child neglect, child maltreatment, child abuse, pathways, internalizing problem, externalizing problem, development, cognitive skills, language, behavior, trajectories, consequences, risk factors, parenting, parent-child interaction, environmental factors, parental depression, and protective factors

Behavior Development in Early Childhood

The moment of conception marks the beginning of a lifelong process of development, in which an individual continually grows and changes biologically, psychologically, and socially. Psychologists have documented child developmental pathways for years, examining the typical and unusual paths of development of cognition and behavior. This dissertation examines behavior patterns over time.

Externalizing behaviors. All children exhibit some externalizing behaviors at some point in time. Externalizing behaviors refer to problems the child has with other people, including aggressive behaviors such as fighting, arguing, stubbornness, and defiance (Achenbach, 1991; Achenbach & Rescorla, 2001). Externalizing behaviors also include attention problems (e.g., can't concentrate or sit still) among young children (Achenbach & Rescorla, 2001) and delinquent behaviors (e.g., lying, stealing) among children age 4 and older (Achenbach, 1991). Children typically begin acting out as early as one year of age to express their dissatisfaction. On average, children have increasing levels of aggression during toddlerhood (between age 1 1⁄2 and almost 3), but their attention capacity improves during this time (van Aken et al., 2008). The child must learn how to regulate his or her responses to stimuli that arouse his or her emotions, and subsequently externalizing behaviors diminish (Carpenter &

Stacks, 2009).

Research regarding externalizing behavior patterns over time has begun to move beyond just the analysis of behaviors among pre-designated groups of children (i.e., boys vs. girls; maltreated vs. non-maltreated). Some studies now use person-centered trajectory analysis such as growth mixture modeling (GMM), which first finds patterns of behaviors in the population then seeks to understand the characteristics of these groups. Using this type of analysis in community samples, researchers have identified subgroups of children following different behavior trajectories over time (Campbell, Thomas, Cook, & Keenan, 2012; Nagin & Tremblay, 1999).

Internalizing behaviors. Internalizing behaviors occur when children direct their emotions inward, exhibiting withdrawn behaviors, somatic complaints, and anxious or depressed behaviors (Achenbach, 1991). Withdrawn behaviors include preferring to be alone, shyness, staring, and sadness, among others. Somatic complaints include nausea, tiredness, headaches and other physical problems when there is no known medical cause. Anxious or depressed behaviors include being nervous, fearful, lonely, crying, feeling worthless, worrying, and similar behaviors.

Keiley and colleagues (2000) documented stable internalizing scores among children from kindergarten through 7th grade, according to maternal report. This was unlike externalizing behaviors, which decreased over time on average (Keiley et al.). Person-centered trajectory analysis of behaviors, following boys from age 2 to age 6, indicated that externalizing behaviors decreased over time while internalizing behaviors increased slightly (Gilliom & Shaw, 2004; Shaw et al., 2003). Like externalizing behaviors, internalizing behaviors among young children, age 2 or 3, predicted a diagnosis of internalizing behaviors at age 10 or 11 (Conners-Burrow et al., 2013).

Co-existing internalizing and externalizing behaviors. Internalizing behaviors and

externalizing behavior problems often co-exist (Achenbach, 1991). Two studies show that higher levels of internalizing behaviors are associated with higher levels of externalizing behaviors over time (Gilliom & Shaw, 2004; M. Keiley et al., 2000). Also, there is evidence that internalizing behavior problems early in life predict externalizing behaviors later in life among girls (Maschi et al., 2008).

Behavior Development of Maltreated Children

Researchers had previously stated that problems with behavior and cognitive development are prevalent among neglected and abused children. This section of the paper reviews existing literature related to behavioral trajectories of maltreated children and following them into the school years.

A study reported that children of caregivers with substance abuse or mental health problems at baseline were twice as likely to have clinically significant externalizing symptoms as children whose parents did not have substance use or mental health problems at baseline (Libby, Orton, Barth, & Burns, 2007). A much later study confirmed the earlier study that children of caregivers who had major depression and who received mental health were much more likely than other children to have clinical-range child behavioral checklist (CBCL) scores and more likely to receive mental health services themselves (Burns et al., 2010). A most recent study stated that caregiver depression was closely related to children's elevated behavior problems (Tabone et al., 2011).

Child related factors are also related to the behavioral paths of maltreated children. A recent study suggested that there is a great deal of continuity between patterns of externalizing behavior in childhood and risk-taking in early adolescence (Thompson et al., 2011). Low

socialization in childhood was found to be associated with increased exposure to contextual risk in mid-adolescence, which in turn increased risk for substance abuse in late adolescence (Knafo et al., 2013). Exposure to physical abuse was found to be predictive of escalating substance use trajectories, which also impact adolescent externalizing behavior problems (Casanueva, Stambaugh, Urato, Fraser, & Williams, 2014). However, protective protectors such social competence, adaptive functioning skills, and positive relationships are associated with more positive behavioral outcomes for maltreated or at-risk children (Schultz, Tharp-Taylor, Haviland, & Jaycox, 2009).

A study using NSCAW data examined externalizing behaviors among children referred to child welfare services nationwide over a three year period (McCrae, 2009). Furthermore, there was a gradual decline in the proportion of children with behavioral needs, although the proportion remained high compared to the general population (McCrae, 2009). Two recent studies use person-centered trajectory analysis to identify subgroups of children- at risk of maltreatment or investigated for maltreatment-following distinct externalizing behavior trajectories (Tabone et al., 2011; Woodruff & Lee, 2011a). Woodruff and Lee (2011) found that more than half of the maltreated preschool children follow a relatively low/normal behavior trajectory with behaviors improving over time, and about one-quarter exhibit more problematic behaviors than the general population initially. The second study by Tabone and colleagues (2011) found five trajectory groups, including most children following low and low-medium trajectories.

Previous sections reviewed the literature on behavior development and trajectories in normal and maltreated populations. Behavioral outcomes of abused children vary, but on average maltreated children score worse than children in normative samples. Multiple factors in the

caregiving environment may impact the development paths and outcomes of children. The literature regarding the influence of child factors and the caregiving environment on the development of children is reviewed below.

Factors Associated with Problematic Behaviors

Factors associated with externalizing problematic behaviors. According to studies, children who have been abused or neglected are at high risk for exhibiting externalizing behavior problems (Dubowitz, Papas, Black, & Starr, 2002; Kotch et al., 2008) and aggressive and criminal behaviors, which may continue into adulthood (Gilbert et al., 2009). In a nationally representative study of children investigated by child welfare services, 42% of children scored in the clinical range for externalizing behavior problems (specifically, aggressive and delinquent behaviors) at least once during a 3-year period (McCrae, 2009). Children abused before age 5 are at higher risk for externalizing behavior problems than children who have not been abused or are abused later in life (Keiley, Howe, Dodge, Bates, & Pettit, 2001). Aggressive and rule-breaking behaviors in childhood often have highly adverse outcomes, including delinquency in adolescence (Green, Gesten, Greenwald, & Salcedo, 2008; Schaeffer, Petras, Ialongo, Poduska, & Kellam, 2003), and criminal behavior in adulthood (Schaeffer et al., 2003).

Child characteristics. In general, boys have consistently higher externalizing behavior problem scores than girls (Bongers, H. Koot, J. Van Der Ende, & F. Verhulst, 2003a; Bongers, Koot, van der Ende, & Verhulst, 2004; Bongers et al., 2003b; Prinzie, Onghena, & Hellinckx, 2006). This is true, too, among physically abused children (Lansford et al., 2006) and children born to teenage mothers (Spieker, Larson, Lewis, Keller, & Gilchrist, 1999) that boys have higher externalizing behavior problems than girls. These results are not uncontested, however, as several studies find no significant differences between boys and girls based on caregiver report

(Deaterdeckard, Dodge, Bates, & Pettit, 1998; McCrae, 2009).

Age at time of maltreatment is also related to externalizing problems. Children abused prior to age 5 had higher parent reported and teacher reported externalizing scores from kindergarten through 8th grade than children not abused or abused after age 5 (Keiley et al., 2001). Similarly, neglect early in life is linked to higher levels of aggression when compared to neglect that occurs later in life and to other forms of maltreatment (Kotch et al., 2008).

Studies examining race as a predictor of externalizing problems have yielded mixed results. For instance, African American children generally had lower levels of mother-reported externalizing behavior compared to Caucasian children in one community sample (M. Keiley et al., 2000), whereas African American children had higher levels of mother-reported externalizing problems over time in another study (Lansford et al., 2006). In a nationally representative study of children and families involved with child welfare services, no significant differences in externalizing behaviors were seen across races during a 3-year period (McCrae, 2009).

Early social and emotional functioning has also been linked to externalizing behaviors. Specifically, low levels of social competence early in life predict later externalizing problems (Lansford et al., 2006). Also, internalizing behavior problems early in life are related to externalizing behaviors later in life among girls (Maschi et al., 2008).

Primary caregiver and caregiving environment. As may be expected, parenting behaviors have been linked to child behavior outcomes. Specifically, children whose mothers had elevated depressive symptoms exhibited more externalizing behaviors (Burns et al., 2010; Dubowitz et al., 2002; Hoffman, Crnic, & Baker, 2006; Spieker et al., 1999). Parental responsiveness has been associated with more positive behavioral outcomes among African American families, particularly those who are poor (Bradley, Corwyn, Burchinal, McAdoo, &

García Coll, 2001). On the other hand, when negative parent–child interactions (Smeekens, Riksen-Walraven, & van Bakel, 2007), negative control (Maikovich, Jaffee, Odgers, & Gallop, 2008), or harsh discipline (Gewirtz, Degarmo, & Medhanie, 2011)are evident at an early age, children are more likely to develop externalizing and internalizing behaviors later. Coercive parenting is associated with higher levels of aggression early in life and slower declines in aggressive behavior over time (Prinzie et al., 2006). Parent-reported physically aggressive behaviors toward the child and child exposure to violence have also been associated with aggressive behavior by children (Johnson et al., 2002).

General Caregiving environment. Related to negative parenting, the type of child maltreatment a young child experiences may be predictive of poor behavioral outcomes (Kotch et al., 2008). Maltreatment type is conceptualized here as a factor in the general caregiving environment because the maltreatment may be perpetrated by the primary caregiver or other caregivers or family members in the environment. More generally, research has demonstrated a link between the number of early risk factors—cumulative risk—and level of behavioral problems in middle childhood (Deaterdeckard et al., 1998) and adolescence (Appleyard, Egeland, van Dulmen, & Sroufe, 2005), and delinquency in adolescence (Green et al., 2008). As the number of risk factors increases the behavioral outcomes worsen. Low socio-economic status has also been associated with higher externalizing problems over time, from kindergarten to 8th grade (Lansford et al., 2006). Yet, socio-economic status did not predict externalizing behaviors in a community sample of younger children followed from 15 months to 5 years of age (Smeekens et al., 2007).

Factors associated with internalizing problematic behaviors. A small body of literature exists for factors associated with internalizing behavioral problems. One recent study

reported that trajectories of internalizing problems vary (Godinet, Li, & Berg, 2013). Some studies reported stable internalizing symptoms from ages 2 to 11 (Keiley et al., 2001; Keiley, Lofthouse, Bates, Dodge, & Pettit, 2003) whereas other studies found decreasing internalizing symptoms in early childhood (Carter et al., 2010; Gazelle & Ladd, 2003). Bongers and colleagues (2003) reported a curvilinear increase of internalizing symptoms over the course of childhood. An interesting study found the heterogeneity characteristic in the course of internalizing behavioral problems of children with maltreatment histories; researchers reported three distinct latent trajectory classes (low-stable, normal-stable, elevated-stable) among a community sample from ages 2 to 14 (Sterba, Prinstein, & Cox, 2007). The researchers reported that two-thirds of the children followed a low-stable trajectory, and smaller proportions followed decreasing/increasing, or elevated-stable trajectories. A study further confirmed that a moderate level of internalizing problems are normative (Fanti & Henrich, 2010) and that children who experienced high initial levels of internalizing problems got worse over time. In contrast, a study found that externalizing problems tend to peak in early childhood but decrease over the course of later childhood (Bongers et al., 2003b; Owens & Shaw, 2003).

Children who have been abused or neglected are at high risk for exhibiting internal behavior problems (Hanson et al., 2001; Libby, Orton, Novins, Beals, & Manson, 2005). They are at risk for mental health problems (Schaeffer et al., 2003), and early and repeat admissions to inpatient psychiatric facilities (Fite, Stoppelbein, Greening, & Dhossche, 2008). Girls appear to experience internalizing behavior problems more often than boys (Fanti & Henrich, 2010; Keiley et al., 2003). However, most studies have found that gender differences of internalizing psychopathology usually do not show up until later childhood or early adolescence (Bongers et al., 2003; Sterba et al., 2007). In terms of emotional reactions to stressful life experiences such as

child maltreatment, the literature suggests a critical distinction between boys and girls (Eschenbeck, Kohlmann, & Lohau, 2007; Ireland, Smith, & Thornberry, 2002). For example, girls were often found to cope with stress by exhibiting internalizing behaviors (Aune & Stiles, 2009; Eschenbeck et al., 2007; Hoffman & Su, 1997)

Some studies reported the importance of race/ethnicity in the prevalence of psychiatric disorders, including depression, anxiety, and aggression (Lansford, Deater-Deckard, Dodge, Bates, & Pettit, 2004; McLaughlin, Hilt, & Nolen-Hoeksema, 2007). However, study findings were inconsistent. A study reported that African Americans have higher levels of depressive symptoms when compared to Caucasians (George & Lynch, 2003). Study findings on the racial/ethnic differences in anxiety symptoms were also inconsistent, with some reporting a Caucasians and non-Caucasians difference (Austin & Chorpita, 2004) but others reported no difference (Scott, Eng, & Heimberg, 2002; Treadwell, Flannery-Schroeder, & Kendall, 1995). McLaughlin et al. (2007) reported in their study that Hispanic females experience higher levels of depression, anxiety, and aggression than Caucasians, African Americans, and Other races. Black males reported the highest levels of overt aggressive behavior, and physiologic anxiety than other racial/ethnic groups (McLaughlin et al.).

Other factors related to child behavioral problems. An emerging literature examining behavior trajectories uses a person-centered analytic approach, which identifies behavioral patterns based on the individual paths of behavior over time rather than depicting patterns of pre-identified subgroups. Race (Petras et al., 2004), maternal depression (Shaw et al., 2003), rejecting parenting style (Shaw et al., 2003), coercive parenting (Tremblay et al., 2004), and poverty (Tremblay et al., 2004) were all found to distinguish children in community samples into subgroups with different outcomes. Additional variables associated with problem behavior

trajectories included early reading achievement (Petras et al.), concentration problems (Petras et al.), and young maternal age (Tremblay et al.). Higher levels of behavior problems often persist throughout elementary school and into middle school (Keiley et al., 2001).

Summary. The research reviewed in the sections prior shows that some child characteristics, parent and parenting characteristics, and environmental factors are related to internalizing and externalizing behaviors. There are mixed findings related to the relationship between child's demographic factors (race and gender) and behavioral development, so these factors are included as control variables. Chronic health problems predict some developmental challenges. Other key factors in the caregiving environment that affect behavior development include maternal depression; caregiver age; parenting practices, poverty, income, and domestic violence. Total risk factors in the environment, including substance abuse and many of the mentioned predictors, has also predicted developmental delay. In addition, analysis of person-centered behavior trajectories among maltreated children provides further evidence of factors associated with persistent high levels of behavioral problems, including caregiver age (Shaw et al., 2003), maternal depression (Burns et al., 2010), and parental styles (Gewirtz et al., 2011). Given that neglected and abused children are at high risk for behavior problems, and they often face risk factors in their environment, it is critical to understand the need for effective interventions in this population of children.

Critical variables that will be tested in this study incorporates the principle of bioecological systems model. It focuses on the direct linkage of child factors (sex, race/ethnicity, age, social skills, maltreatment type, exposure to violence, risk factor index, physical health, and cognitive disability), parent/caregiver factors (age, educational attainment, income level, family structure, employment status, number of children in the household, permanent caregiver, out-of-

home placement, domestic violence, social support, and perception of the neighborhood), and environmental factors (poverty, number of juvenile arrests, access to social services, civic engagement, percentage of social workers, percentage of white population, percentage of black population, and percentage of Hispanic population).

Conceptual Model to Guide the Dissertation

Figure 2 presents a conceptual model for this dissertation and is based on bioecological model of child development. The framework reflects how child development is influenced by the combination of the individual child characteristics, the caregiver characteristics, and environmental characteristics, and the interaction between them over time (Bronfenbrenner, 2005). The combination of different factors will continue to influence the behavior of the child over time. Depending on the time period, maltreated children may exhibit behaviors that are problematic. Therefore, it is imperative to identify those factors that influence their behavioral trajectory.

Most of the research describing behavior problems examines an average pattern of change for a population or differences by specific subgroups (e.g., gender, race, maltreatment experience). Depictions of average patterns may mask the distinctive trajectories that exist in the data. In the field of developmental psychopathology, studies of aggression have identified distinctive behavior patterns for subgroups that have emerged from the data rather than by specifying subgroup characteristics (Nagin & Tremblay, 1999; Petras et al., 2004). Currently there are no studies focusing on children involved with child welfare services to identify various populations who experience distinct behavioral paths. Identifying behavioral paths that emerge directly from the data rather than based on preconceived subgroups may offer practitioners more precision in determining which children need what kinds of interventions to avoid negative

behavioral outcomes.

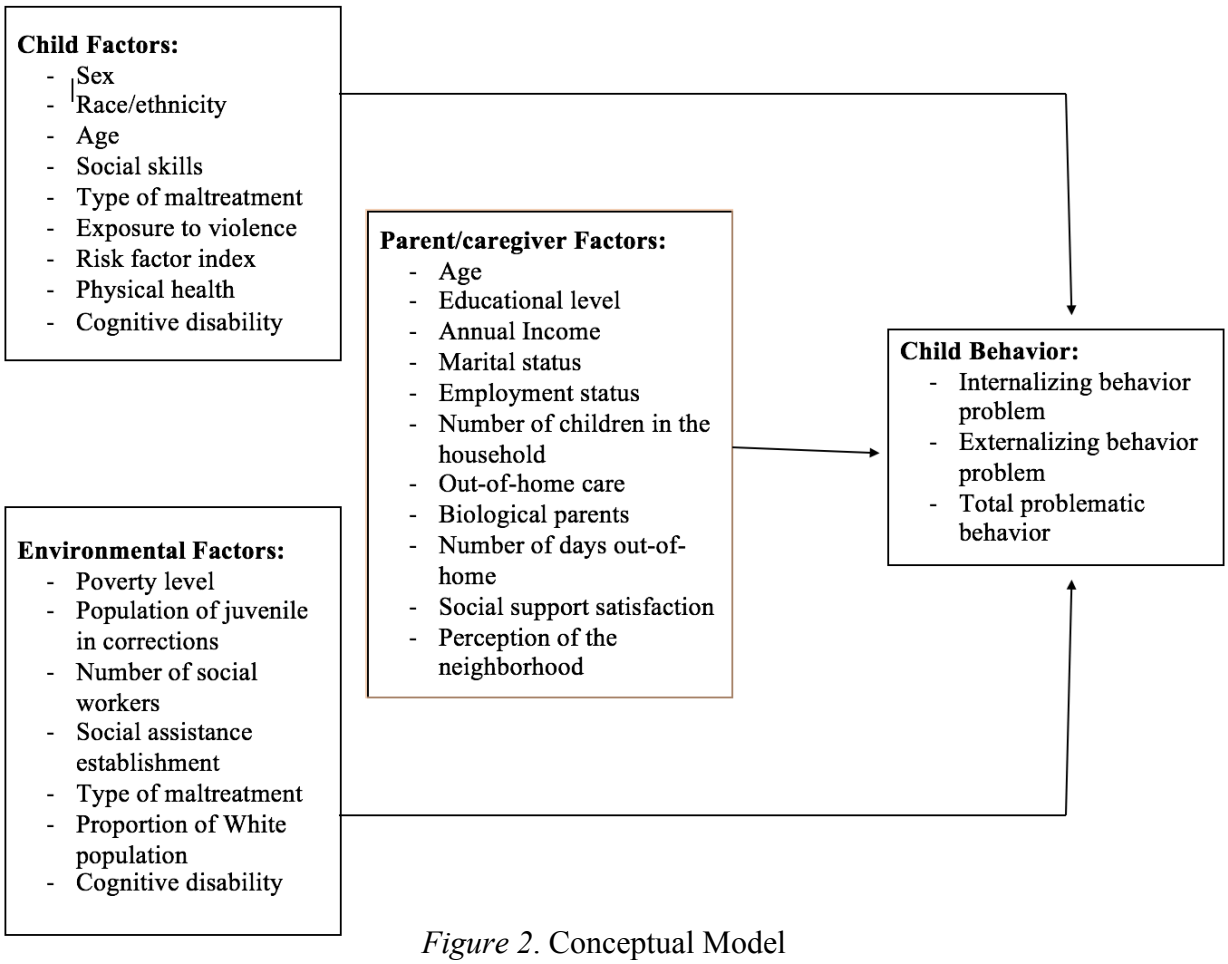


Figure 2. Conceptual Model

This study will identify subgroups of children investigated by child welfare services who follow distinct externalizing and internalizing behavior trajectories. The size and characteristics of these subgroups will be described. Multivariate analyses will then identify factors that predict membership in the problematic groups compared to the normal group.

Knowledge gaps

Studies examining behavior trajectories of abused and neglected children using longitudinal data thus far have examined pre-determined groups, such as maltreatment timing and harm status (Keiley et al., 2001) and clinical versus non-clinical levels of mental health problems at discrete time points (McCrae, 2009). While these studies are important, it is critical

to focus in on the actual emergent behavioral paths of a whole sample of children and understand the combination of factors that predict negative behavioral paths. By first identifying the distinct behavioral patterns and then understanding the characteristics of children who are likely to follow each pattern, interventions can be more clearly directed. For example, identifying children within a sample likely to follow a negative behavioral path and the factors that predict the negative behavior pattern has the potential to help child welfare practitioners more accurately identify and serve the highest risk children early in life to receive more intensive preventive services and, thereby, avert future negative outcomes such as mental health problems and criminal involvement.

A person-centered approach, growth mixture modeling (GMM), was used in this study to tease out naturally occurring groups of young children referred for maltreatment who follow distinct behavioral paths over 6 years. Once the groups are identified, bivariate and multivariate analytic methods will be used to describe the characteristics of each group and identify predictors.

Overall Purpose of the Dissertation

This study will identify subgroups of children investigated by child welfare services that follow distinct externalizing and internalizing behavior trajectories. The size and characteristics of these subgroups will then be described. Multivariate analyses will identify factors that predict membership in the problematic groups compared to the normal group.

Research Questions

The research questions for this study are outlined below, organized by the aims of the dissertation. For each aim, a general hypothesis is provided. The ecological framework adapted from Bronfenbrenner's Bioecological Systems model incorporates previous research and

provides a theoretical framework for exploration of these research questions. This study includes three aims with associated research questions (RQs).

Aim 1: Identify the number, shape, and size of subgroups of children following distinct behavioral trajectories.

1. How many distinct trajectories of internalizing behavior development do subgroups of children follow? What shape are these trajectories? What proportions of children follow normal and problematic trajectories?
2. How many distinct trajectories of externalizing behavior development do subgroups of children follow? What shape are these trajectories? What proportions of children follow normal and problematic trajectories?
3. Is there a relationship between membership in problematic internalizing and externalizing trajectory groups?

In general, it was hypothesized that children follow a relatively normal behavioral path, while a small group exhibit a high level of behavior problems, and still others follow improving or worsening problematic paths.

Aim 2: Describe the characteristics of children in distinct behavior trajectory groups.

1. What child characteristics, parenting behaviors, and characteristics in the broader caregiving environment describe each internalizing behavior trajectory group? Are there significant differences in characteristics across internalizing and externalizing behavior trajectory groups?
2. What child characteristics, parenting behaviors, and characteristics in the broader caregiving environment describe each externalizing behavior trajectory group? Are

there significant differences in characteristics across internalizing and externalizing behavior trajectory groups?

Children with a chronic health condition, parent and parenting risk factors (young maternal age, low education, single, depressive symptoms, less responsive parenting, less learning stimulation, harsh parenting, neglectful parenting), and risk factors in the broader caregiving environment (domestic violence, low income, more children) at baseline were hypothesized to be more likely to be members of problematic behavior groups.

Aim 3: Explore the predictors (child, parent/caregiver, and environmental) for the intercept and slope of growth trajectory of the three behavioral problem groups.

1. What caregiver/parental factors in the caregiving environment related to each behavior trajectory group in multivariate analysis?
2. What child, caregiver/parental, and environmental factors related to internalizing, externalizing, and co-occurring (total) problem trajectory groups?

Children with low social skills are likely to exhibit behavioral problems than children with high social skills. In general, it was hypothesized that female children exhibit internalizing behaviors than male children. Caregivers and parents with low social support satisfaction increase the behavioral problems of the child. Children living in an unsafe environment are likely to exhibit problematic behaviors.

Definition of Terms

Internalizing behavior- includes depression, anxiety, and withdrawal from other people. It can result in mild to severe consequences because the behavior is drawn inward, such as affecting psychological and emotional state (Perle et al., 2013).

Externalizing behavior- consists of violence, harassment, defiance, disruptiveness, and acting out. The construct of externalizing behavior problems includes behavior problems that are manifests in children's outward behavior and reflect the child negatively acting on the external environment (Liu, 2004).

Description of Instrumentation

Child Behavior Checklist- The CBCL is one of the most widely used standardized instruments used to evaluate child behavior (Achenbach, 1991). Developed by Thomas Achenbach, it measures child competence (in the realms of activities, social, and academic) as well as externalizing and internalizing problems as reported by an adult, usually a parent or caregiver. For the CBCL to be completed, the child must be between the ages of 2 to 18. The items on the CBCL are measured on a 3-point scale ranging from 0 (not true) to 3 (very true). Thus, higher scores are indicative of greater externalizing or internalizing problems (Achenbach, 1991).

Chapter 3: Study Method

Research Design

This study involved secondary data analysis of existing data from the National Data Archive on Child Abuse and (NDACAN), National Survey of Child and Adolescent Well-Being (NSCAW), a longitudinal panel study of child welfare-involved children (described in detail below). The current study analyzed NSCAW data in a three-level multilevel model. This model investigated individual differences in behavioral problems (internalizing, externalizing, and total) over a period of approximately six (6) years. Observed differences in growth trajectories for maltreated children were examined by analyzing multiple predictors, including child, caregiver, and environmental factors.

This study explores the long-term effects of hierarchically structured child, caregiver, and environmental factors on child behavior by examining the dependent variable longitudinally. Therefore, growth mixture modeling (GMM) is the best statistical approach to utilize in this study. Whereas researchers have attempted to account for the nested nature of child maltreatment utilizing multiple regression and ANOVAs, these approaches are less adequate for many reasons as described below.

Multiple regression analyses are inadequate for use in the current study Utilizing a typical multiple regression to analyze change over time will likely result in smaller standard errors (Raudenbush & Bryk, 2002). This is because the assumption of independent observations is violated for longitudinal data. It is inaccurate to assume that an individual's response at baseline is independent from future responses on the same scale. Additionally, it is plausible to suspect that children in the same geographical area might be impacted similarly, thus another clear potential violation of this assumption. The NSCAW data to be used in the current study are from

the same children to whom the same instrument has been administered over time and who are grouped within primary sampling units (PSUs). Thus, a standard multiple regression is inappropriate for this longitudinal study.

Analysis of Variance (ANOVA) is also inappropriate for the current study. Although repeated measures ANOVA is applicable to examine longitudinal data, this will not accurately measure differences in internalizing and externalizing problems over time. Also, traditional repeated measure ANOVA requires equal spaced repeated measures and no covariance allowed for the errors (even though these assumptions have been relaxed theoretically later, statistical inferences have not fully embodied such flexibility). Using ANOVAs when there are multiple groups (e.g., PSUs) requires the inclusion of numerous variables, which reduces statistical power. Additionally, ANOVAs does not handle missing data well and complicates the results if the sample size is small. With ANOVAs, cases exhibiting any missingness at any data point are eliminated from the analyses. Conversely, it is possible to include all data in GMM analyses regardless of missingness on specific time periods; thereby utilizing all the variable data and increasing statistical power and reducing wasted information (Singer, 2003). Lastly, variability of random effects due to dependency of observations (e.g., PSU effects) is ignored when using ANOVAs whereas it is one of the primary interest to study in GMM. This may potentially result in making inaccurate interpretations (Luke, 2004). However, GMM accounts for these violations, which produces more accurate estimates (Jung & Wickrama, 2008; Murphy, 2012; Nylund, Asparouhov, & Muthén, 2007). In sum, GMM can accommodate the difficulties that repeated measure ANOVA may have for this longitudinal data.

Data Source

This study uses the data collected over a six (6) year time period from the National

Survey of Child and Adolescent Well-Being (NSCAW), which is a national survey that follows the same children over time that have had some type of contact with the child welfare system between October 1999 and December 2000. The NSCAW was funded by the Department of Health and Human Services, Administration on Children and Families. Furthermore, the data were collected by a collaborative research team including academic researchers, statisticians, and other experts. The team was comprised of individuals at the Research Triangle Institute, the University of North Carolina at Chapel Hill, Caliber Associates, the University of California at Berkeley, and the Child and Adolescent Services Research Center at San Diego Children's Hospital. It was the first study that attempted to solicit information from individuals involved in the child welfare system rather than relying on secondary data collected by state agencies. Additionally, it sought to incorporate measures to examine the impact of maltreatment from an ecological perspective, which results in a dataset ideal for multilevel analysis (Dowd et al., 2008).

Sample

Table 1.1 presents descriptive statistics for the sample of children in this study. The 5,501 children are involved with child welfare services or are reported to CPS. Children ages range from 0 to 16 years old, with an average of 5.70 years old. About 50.3 percent of the children were girls. Most children suffered neglect type of maltreatment (23.7%), over a fifth (21.1%) suffered physical maltreatment, and about a fifth (20.9%) suffered physical neglect. About 42.9 percent of the children identified as White, over a third (32.1%) Black or African American, 17.4% Hispanic or Latino, and 7.3% of another race or ethnicity.

About a third (28.6%) of the caregivers completed an educational level between Ninth and Eleventh Grade, over a fifth (23.5%) Twelfth Grade or GED, and 7.8% have Eight Grade or

less level of education. About a fourth (25.1%) of the families have household income between $10,000-$19,999, and over a fifth (20.3%) have household income between $0-$9,999. About 37.1 percent of the caregivers were married and one third were currently single or never married (30.0%). Thirty-five percent of the caregivers are aged between 26-35 years old and 25.0% aged between 36-45 years old. Most of them (62.3%) are the biological caregivers of the children. About half (49.6%) of the cases were either substantiated or indicated, and 29.0% were neither substantiated nor indicated.

Table 1.1 Characteristics of children and their families referred to CPS and investigated for maltreatment at Wave 1 of the NSCAW study

Characteristics	**n**	**%**
Child Demographics:		
Gender:		
Male	2732	49.7
Female	2769	50.3
Type of Maltreatment:		
Physical Maltreatment	1158	21.1
Sexual Maltreatment	597	10.9
Emotional Maltreatment	318	5.8
Physical Neglect didn't provide	1147	20.9
Neglect- no supervision	1306	23.7
Abandonment	157	2.9
Moral/legal Maltreatment	28	0.5
Educational Maltreatment	66	1.2
Exploitation	12	0.2
Other	240	4.8
Child Race:		
Black/non-Hispanic	1767	32.1
White/non-Hispanic	2362	42.9
Hispanic	956	17.4
Other	399	7.3
Caregiver Demographics:		
Highest Grade Completed:		
Eight Grade or Less	431	7.8
Ninth Grade to Eleventh Grade	1571	28.6
Twelfth Grade or GED	1294	23.5
Vocational/Technical	276	5.0
Any College	499	9.1
Annual Family Income:		
$0 - $9,999	1116	20.3

$10,000 - $19,999	1379	25.1
$20,000 - $29,999	887	16.1
$30,000 - $39,999	567	10.3
$40,000 and greater	1042	18.9
Marital Status:		
Married	2043	37.1
Separated	675	12.3
Divorced	917	16.7
Widowed	169	3.1
Never Married	1650	30.0
Age Range:		
<=25 years old	1229	22.3
26-35 years old	1925	35.0
36-45 years old	1376	25.0
46-55 years old	575	10.5
>55 years old	342	6.2
Biological Caregiver:		
Yes	3429	62.3
No	2036	37.0
Substantiated Case:		
Yes	2730	49.6
No	1198	29.0

IRB Protocol and License to Use the NSCAW Data

To use the NSCAW dataset, the National Data Archive for Child Abuse and Neglect (NDACAN) requires the researchers to apply for a data user license and take a series of steps to protect the data. Details about access to the dataset are available on the NDACAN website at http://www.ndacan.cornell.edu/NDACAN/Datasets/Order_Forms/NSCAW_Acquiring_Data.html. The researchers submitted an application, license agreement, data protection plan, and IRB protocol approved by the researcher's research institution (i.e., the University of Hawaii at Manoa, Honolulu [UHM] Institutional Review Board [IRB]). The IRB protocol for this dissertation, with Dr. Paula Morelli as the Principal Investigator, was approved by the University of Hawaii IRB February 13, 2016. The IRB protocol was filed under an existing NSCAW User License for University of Hawaii researchers, maintained by Dr. Paula

Morelli.

Sampling

NSCAW Sampling Strategy. The NSCAW collected data from children, caregivers, teachers, and child welfare workers for children ages birth to fourteen (14) years of age at baseline who had some interaction with the child welfare system between October 1999 and December 2000. The sample included both a child protection services (CPS) sample (n = 5,501) as well as a long-term foster care (LTFC) sample (n =727). For the purposes of this study, only children in the CPS sample were included in this analysis. It was determined that the LTFC data was inappropriate to include in this study due to restrictions on data collected for the primary caregiver. In the LTFC sample, the biological caregiver information (e.g., caregiver history of maltreatment) was not included in the data. Therefore, including the LTFC data could potentially lead to misleading conclusions. Participants were followed for approximately six (6) years with assessments administered at five (5) points in time: (a) close of investigation (wave 1); (b) 12 months after close of investigation (wave 2); (c) 18 months after close of investigation (wave 3); (d) 36 months after close of investigation (wave 4); and (e) 59-96 months after close of investigation (wave 5).

The research team also utilized advanced sampling procedures (specifically, two- stage stratified sampling) to define primary sampling units (PSUs). PSUs were generally defined as geographic areas served by one (1) CPS agency. Therefore, PSUs could be made up of more than one (1) county depending on the size of the geographic area and CPS caseload. In the first stage, the research team divided the United States into nine (9) sampling areas based on child welfare caseloads. The first eight (8) areas are comprised of the eight (8) states with the largest child welfare caseloads while the final area was comprised of the remaining thirty-eight (38) states and

Washington, D.C. From these nine (9) sampling areas, the research team then randomly selected PSUs to include in the research study utilizing a probability-proportionate-to-size (PPS) procedure aimed to give areas with larger caseloads a higher probability of being selected. From the PSUs, counties were then selected based on size. Only counties that were large enough to justify at least one caseworker (at least 60-67 cases per year) were selected for inclusion in the sample. Lastly, a within-PSU sample was then obtained using eight (8) sampling domains based on age, whether the participant had received services, and type of maltreatment.

The research team also employed rigorous inclusion criteria to ensure minimal intrusion on the children and families included in this study and to minimize duplication of cases. Once the child was selected in one frame, they were then deleted from subsequent cases so they would not be randomly selected a second time. Additionally, if there were multiple children in the household with allegations of maltreatment that were selected in the sample, siblings were then deleted and not included in sampling frame. Lastly, children who were also perpetrators of maltreatment were also eliminated from the sampling frame. Once the research team completed all of the aforementioned steps, they utilized simple random sampling to comprise the final sample.

Current Study Sampling Strategy. The current study is a secondary data analysis of data from the NSCAW. As noted, data from the NSCAW child protective services (CPS) sample will be used, consisting of children and families investigated or assessed for allegations of abuse or neglect between October 1999 and December 2000 (n = 5,501; NSCAW, 2007). Information about the sampling method and design are described elsewhere (NSCAW Research Group, 2002)

Following this initial sampling for the CPS-specific sample, data were investigated for missingness on the child, caregiver, and environmental-level predictors. Children were included

in the sample whether or not the maltreatment reports were substantiated because children reported to child welfare services are at risk of poor developmental outcomes regardless of substantiation status (Barth, Scarborough, Lloyd, Casanueva, & Mann, 2008; Hussey, Chang, & Kotch, 2006).

Operationalization of Variables

All measures used in this analysis were available in the NSCAW General Release dataset. The outcome variables (child externalizing and internalizing behaviors) and predictor variables (child, caregiver, and environmental characteristics) are described below. Baseline (Wave 1) characteristics were selected as predictors because these factors are known at first contact with child welfare services and may identify subgroups of young children and their families to target for more intensive intervention and prevention efforts.

Main Predictor Variables. Main predictor variables were measured on all three (3) levels: time variant child and caregiver factors (level-1), time invariant child and caregiver factors (level-2), and time invariant environmental factors (level-3). Each of the included predictor variables have been selected based on evidence presented in the development of the conceptual framework. Table 1 shows which predictor variables are included in this study, level of measurement, how they were operationalized, and psychometric information if standardized instruments were used.

Table 1.2 Main Predictor Variables (Level-1, Level-2, Level-3)

Variable	Operationalization	Values to be used in the analysis
CHILD FACTORS		
Sex (level-2)	*Is the child male or female?*	Child sex was coded as follows: 1 =male 0 =female (ref cat)

Race/ethnicity (level-2)	*What is the child's race/ethnicity?*	Child race/ethnicity was recoded as follows: 0 = Black/Non-Hispanic (ref cat) 1 = White/Non- Hispanic 1 = Hispanic and Other
Age (level-1)	*What is the child's age?*	Continuous variable ranging from 2-18
Social Skills (level-1) *Social Skills Rating System (SSRS)* *Internal consistency Cronbach's alpha = 0.73-0.95*	*Social skills standard-preschool* *Social skills standard-elementary* *Social skills standard score-secondary*	Three variables (preschool, elementary, and secondary) were combined to form one variable encompassing child social skills, which is a continuous variable Higher scores are indicative of higher level of social skills
Maltreatment type (level-2)	*Type of maltreatment?* *Was the maltreated substantiated?*	This variable was recoded as follows: 0 =physical maltreatment (ref cat) 1 =sexual maltreatment 1 = physical neglect did not provide 1 =neglect- no supervision 1 = Other Abuse (emotional, educational, abandonment, exploitation, moral/legal, other)
Exposure to violence (level-1) *Violence Exposure Scale for Children (VEX-R)* *Internal consistency Cronbach's alpha = 0.72-0.86*	*Look at the following cards (violence photos) and answer the question using the following guide:* 1=*never; 2=one time;* 3= a *few times;* 4= *lots of times.* *If so, have you seen this happen in the last month? 1=yes; 2=no* *Did you also see it happen before that?* 1=*yes, 2=no* *Have you seen this happen with the people you live with now?* 1=*yes, 2=no*	Mild/severe violence total exposure Higher scores are indicative of greater exposure to violence
Risk factor index (level-1)	*Index created from five* (5) *variables: (a) another supportive caregiver in*	Ordinal variable ranging from 0-5, with higher scores indicating higher risk level:

	home; (b) high stress in family; (c) low social support; (d) family has trouble paying for basic needs; (e) active domestic violence)	0 =no risk factors (ref cat) 1 =1 risk factor 1 =2 risk factors 1 =3 risk factors 1 = 4 risk factors or more
Physical health (level-1)	*Overall, would you say [fill CHILD)'s health is …* 1 = *excellent,* 2 =*very good,* 3 =*good,* 4 =*fair,* or 5 =*poor*	This variable was recoded as follows: 1 = poor 1 =fair 1 =good 1 = very good 0 = excellent (ref cat)
Cognitive disability (level-2) *K-BIT=Kaufman Brief Intelligence Test* *Internal consistency:* *Vocabulary= 0.89- 0.98* *Matrices= 0.74- 0.95*	*If either PLS* or *K-BIT scores < 70, then set to Yes …1f either PLS* or *K-BIT scores are missing, then set to missing …For all others, set to No* 1=*yes,* 2=*no*	This variable was recoded as follows: 0 = no (ref cat) 1 = yes
CAREGIVER FACTORS		
Age (level-1)	*What is the caregiver's age?*	This variable was coded as follows and treated as an ordinal variable: 0 = <= 25; (ref cat) 1 =26-35 years 1 =36-45 years 1 =46-55 years 1 = > 55
Educational attainment (level-1)	*What is the caregiver's highest degree?*	This variable was recoded as follows: 0 =None (ref cat) 1 =high school diploma or equivalent, vocational 1 =Associate Deg., RN Diploma 1 =Bachelor's Degree 1 = Master's Degree, M.D., Ph.D. 1 = Other
Income level (level-2)	*What is the caregiver's annual income?*	Income was coded as follows and treated as an ordinal variable: 0 = $0-$9,999 (ref cat) 1 = $10,000- $19,999

		1 =$20,000- $29,999 1 =$30,000- $39,999 1 =$40,000 and greater
Family structure (level-1)	Marital status *Please indicate your current marital status...1=married, 2=separated, 3=divorced, 4=widowed, or 5=never been married?*	Marital status was recoded as follows: 0 =married (ref cat) 1 = separated 1 = divorced 1 = widowed 1 = never married
Caregiver's current employment status	Employment status *Please indicate your current employment status…1=work full-time 35 or more hours/week, 2=work part-time less than 35 hours/week, 3= work sometimes, when work is available, 4=does not work*	Employment status was recorded as follows: 0 = work full-time 35 or more hours/week (ref cat), 1 =work part-time less than 35 hours/week, 1 = work sometimes, when work is available, 1 =does not work
Number of children in the household (level-1)	*How many children live in the household?*	This variable is coded as follows and treated as an ordinal variable: 0 =1 child (ref cat) 1 = 2 children 1 =3 children 1 =4 children 1 = >= 5 children
Permanent caregiver (level-1)	*Was respondent [FILL CHILD)'s permanent caregiver or was [FILL CHILD] living in out-of-home care (e.g., this is* a *foster home, etc.)?* *1=permanent caregiver, 2=out-of-home care setting (foster home, etc.)*	This variable was recoded as follows: 0 = out-of-home caregiver (e.g., foster care, etc.) (ref cat) 1 =permanent caregiver
Biological caregiver (level-2)	*Was respondent [FILL CHILD)'s biological caregiver?* 1 =*yes,* 2 =*no*	This variable was recoded as follows: 0 =no (ref cat) 1 =yes
Out-of-home placements (level-1)	*Total number of days in OOH care*	Continuous variable
Domestic violence (level-1)	*Answer the question using the following guide:* 1=1 *time, 2=2 times,* 3=3-5	Total number of violent episodes Continuous variable

	times, 4=6-10 times, 5=11-20 times, 6=More than 20 times, 7=Not in past 12 *months, but it happened before, 0= This has never happened* *In the past* 12 *months, how many times has* a *partner of yours ...* *Thrown something at you?* *Pushed, grabbed, or shoved you?* *Slapped you?* *Kicked, bit, or hit you with* a *fist?* *Hit or tried to hit you with something?* *Beat you up?* *Choked you?* *Threatened you with* a *knife or gun?* *Used* a *knife or fired* a *gun on you?*	Higher scores are indicative of a higher number of violent episodes
Social support (level-1) *Duke-UNC Functional Social Support Questionnaire (FSSQ)* *Test-retest reliability* *Mean= 0.66*	*Please look at the following cards and rate on the following scale:* 1=*very dissatisfied, 2=dissatisfied, 3=satisfied, or 4=very satisfied* *How satisfied are you with the number* of *different people ...* *You count on to invite you to* go *out and do things?* *That help you with taking care* of *your child or children?* *You count on give you chances to talk about money matters like budgeting or money problems?* *That give you useful advice about important things in life?* *That give you help when you need transportation?*	Mean social support satisfaction score Mean social support scale ranging from 1 (low social support satisfaction) to 4 (high social support satisfaction)

	That give you help when you're sick in bed? *That give you help with cooking and housework?*	
Perception of neighborhood (level-1) *No psychometric properties reported*	*For each item I read, please tell me if this issue is:* 1 = *not* a *problem at all,* 2 =*somewhat* of a *problem, or* 3 = a *big problem in your neighborhood.* *Assaults and muggings?* *Delinquent gangs or drug gangs?* *Open drug use or drug dealing?* *Unsupervised children?* *Groups* of *teenagers hanging out in public places and making* a *nuisance* of *themselves?*	Continuous variable calculated from the sum of scores on each item. Scores range from 9 (favorable) to 27 (less favorable)
ENVIRONMENTAL FACTORS		
Poverty (level-3)	*Percentage* of *households living below 150%* of *federal poverty line within PSU*	Continuous variable
Number of juvenile arrests (level-3)	*Percentage of children (age 0-17) in juvenile corrections within PSU*	Continuous variable
Access to social services (level-3)	*Composite variable created from the following:* *• Number of civic organizations per capita* *• Number of social assistance establishments per capita*	Continuous variable created from summing the following variables: (a) number of civic organizations per capita and (b) number of social assistance establishments per capita
Civic engagement (level-3)	*Percentage* of *population over the age of 18 who voted in the year 2000.*	Continuous variable
Social Workers (level-3)	*Percentage of social workers in the year 2000*	Continuous variable
White Population (level-3)	*Percentage of White (non-Hispanic) population within PSU*	Continuous variable

Black Population (level-3)	*Percentage of Black (non-Hispanic) population within PSU*	Continuous variable
Hispanic Population (level-3)	*Percentage of Hispanic population within PSU*	Continuous variable

Criterion Variables. The three (3) criterion variables (internalizing behavioral problems, externalizing behavioral problems, total behavioral problems) were all measured on level-1 (time variant) utilizing the Child Behavior Checklist (CBCL). The CBCL is one of the most widely used standardized instruments used to evaluate child behavior. Developed by Thomas Achenbach, it measures child competence (activities, social, and academic) as well as behavioral and emotional problems as reported by an adult, usually a parent or caregiver. In order for the CBCL to be completed, the child must be between the ages of 2 to 18. For this study, only the 118 items assessing behavioral and emotional problems are utilized. The items on the CBCL are measured on a 3-point scale ranging from 0 (not true) to 3 (very true). Thus, higher scores are indicative of greater behavioral and/or emotional problems (Achenbach, 1991).

The CBCL is comprised of nine (9) subscales: (a) Aggressive Behavior, (b) Anxious/Depressed, (c) Attention Problems, (d) Delinquent Behavior, (e) Social Problems, (f) Somatic Complaints, (g) Thought Problems, (h) Withdrawn, and (i) Sex Problems. Three (3) of these subscales (Withdrawn, Somatic Complaints, Anxious/Depressed) will be combined to form the Internalizing Problems Scale, while two (2) of the subscales (Delinquent Behavior, Aggressive Behavior) will be combined to make up the Externalizing Problems Scale. Scores are converted to T-Scores and standardized with cut-off values indicating whether a child is exhibiting normal, borderline, or clinically significant behaviors (Achenbach, 1991). Table 2 describes the psychometric properties for the CBCL.

Table 2. Criterion Variables (Level-1)

Variable	Operationalization	Values to be used in the analysis
INTERNALIZING BEHAVIORAL PROBLEMS		
Internalizing behavioral problems (level-1) *Child Behavior Checklist* *Test-retest reliability = 0.93*	32 items from the Child Behavior Checklist (CBCL) Comprised of withdrawn, somatic complaints, and anxious/depressed subscales of CBCL	T-scores can range from 0-100, with higher scores indicative of greater internalizing behavioral problems. T-scores less than 60 are considered "normal", between 60 and 63 are considered "borderline", and T-scores greater than 63 are considered "clinical".
EXTERNALIZING BEHAVIORAL PROBLEMS		
Externalizing behavioral problems (level-1) *Child Behavior Checklist* *Test-retest reliability = 0.89*	33 items from the Child Behavior Checklist (CBCL) Comprised of aggressive behavior and delinquent behavior subscales of the CBCL	T-scores can range from 0-100, with higher scores indicative of greater internalizing behavioral problems. T-scores less than 60 are considered "normal", between 60 and 63 are considered "borderline", and T-scores greater than 63 are considered "clinical".
TOTAL BEHAVIORAL PROBLEMS		
Total behavioral problems *Child Behavior Checklist* *Test-retest reliability = 0.93*	118 items from the Child Behavior Checklist (CBCL) Comprised of withdrawn, somatic complaints, anxious/depressed, social problems, thought problems, attention problems, delinquent behavior, aggressive behavior, and sex problems subscales of the CBCL	T-scores can range from 0-100, with higher scores indicative of greater internalizing behavioral problems. T-scores less than 60 are considered "normal", between 60 and 63 are considered "borderline", and T-scores greater than 63 are considered "clinical".

Analysis Plan

This study involved three phases to answer the three research questions about children whose families were investigated for child maltreatment. In the first phase, growth mixture modeling (GMM) was used to identify subgroups of children following distinct developmental trajectories for externalizing and internalizing behaviors over the course of 6 years. In the second phase, the characteristics of children in each subgroup were identified by the GMM (Jung & Wickrama, 2008; Liu & Hancock, 2014). Finally, multinomial logistic regression was used to identify predictors of group membership.

Growth Mixture Modeling (GMM). GMM is a person-centered statistical approach of identifying latent subgroups within a heterogeneous population that follow distinct trajectories over time for a given outcome that is measured repeatedly (Jung & Wickrama, 2008; Liu & Hancock, 2014). The number of classes (i.e., naturally occurring subgroups) is estimated by modeling a range of class numbers and determining the best fit for the data set (Jung & Wickrama, 2008; Liu & Hancock, 2014). Based on the assumption that the subgroups are homogenous, GMM freely estimates the within class variances (Jung & Wickrama, 2008; Liu & Hancock, 2014; Nagin, 2005); the variance of the intercepts and slopes are held at zero for simplicity in modeling (Liu & Hancock, 2014).

Specifying the GMM model. Standard T-scores from the CBCL externalizing and internalizing behaviors subscales measured at the 4 time points were entered into a series of unconditional GMM models using M*plus* Version 7.41 with the mixture add-on (Muthén & Muthén, 1998–2007). Nested linear and quadratic GMM models were estimated, followed by several growth mixture models (GMM). Several fit indexes were examined to identify the optimal model. Based on recommendations in the literature the Bayesian Information Criterion

(BIC), bootstrap likelihood ratio test (BLRT), and entropy were given the most credence when determining the number of latent classes (Nylund et al., 2007). Other considerations in determining the number of classes includes: successful convergence, high entropy value (near 1.0), no less than 1% of total count in a class, and high posterior probabilities (near 1.0) (Jung & Wickrama, 2008). Graphic output will also be examined to observe whether or not the resulting classes are distinct and meaningful, and whether the shape of the estimated trajectory fit the actual sample means well. The individual trajectories for the children assigned to each class were examined to observe how well they fit the estimated trajectory group line. Posterior probabilities (the likelihood that an individual child would belong in each of the classes), most likely group membership (the group in which the child has the highest posterior probability of membership), and growth parameters were examined in the optimal model.

Describing characteristics and identifying predictors of the latent trajectory classes. Once the best-fitting model was identified, bivariate analyses were conducted to examine the characteristics of each latent trajectory class and to identify correlations between class membership and theoretically relevant covariates. Multinomial logistic regression analyses were conducted to identify characteristics predicting membership in the behavior trajectory groups.

Handling of missing data. Like any large national longitudinal dataset, NSCAW has missing data for portions of some individual cases (e.g. may have child data but not caregiver data or caseworker data, or certain items have no response) and for entire cases at some waves of data collection (i.e. some individual cases have missing information at some data points). The amount of missing data in the NSCAW dataset is relatively low, in part because the NSCAW team imputed data for some variables-including primary maltreatment type- when the data were missing (NSCAW, 2014). In the GMM models missing data were handled using maximum

likelihood estimation, which assumes data are missing at random (Schafer & Graham, 2002). M*plus* is capable of providing multiple imputation of missing data using Bayesian analysis to address missing values (Schafer & Graham).

Chapter 4: Results

Results from analyses addressing the three aims of the current study are presented in this chapter. First, to address the first aim of the study, the results from the GMM analyses identify the number of subgroups of children following distinct developmental trajectories. Results are presented for internalizing behaviors, then externalizing behaviors, and total problematic behavior; results include standard CBCL scores, model selection, and trajectories identified.

Next, aim 2 results are presented. The characteristics of the children are described. The results from the GMM analyses identified one group only. Based on the criteria, the model fit suggested that multi-group analysis is not feasible. Further explanation is provided below.

For aim 3 of the study, the effects of factors (child, caregiver/parent, and environmental) are examined through multinomial logistic regression. Results regarding internalizing behavior, externalizing behaviors, and total problematic behavior are presented.

Aim 1: Identify the number, shape, and size of subgroups of children following distinct behavioral trajectories.

Growth mixture modeling (GMM) was used to identify the number of subgroups of children reported for maltreatment who followed behavioral trajectories over time. Before using GMM, a preliminary analysis was conducted to check if the data warrants further investigation using growth mixture modeling. The results are displayed in the Appendix A section. The graphs depicted further investigation because of the heterogeneity of the data. The standard scores for each outcome measure were entered into a series of GMM models using M*plus* 7.4 to identify the optimal number of classes and shape of the developmental trajectories. Results are summarized for internalizing, externalizing, and total behavior trajectories in the following sections and a description of the developmental trajectories that emerged.

Internalizing Behaviors

Internalizing behavior scores. CBCL internalizing behavior scores for the children at each wave of data collection are presented in Table 3. The average standard CBCL T-scores ranged from 55.56 at Wave 1 to 51.37 at Wave 5. Mean T-scores were in the normal range, with the highest score at Wave 1 (*M*=55.56). On average, 21.72% of the children had internalizing behavior in the borderline or clinical range at least one of the 4 waves, with highest number of borderline or clinical children at Wave 4.

Table 3. Internalizing CBCL T-Scores

***N*=5501**	**Wave 1 (Baseline)**	**Wave 3 (18 months post baseline)**	**Wave 4 (36 months post baseline)**	**Wave 5 (64-73 months post baseline)**
N	3763	3987	4619	3376
Missing	1738	1514	882	2125
Internalizing T-scores				
Mean	55.56	53.89	53.29	51.37
Std. Dev.	11.61	11.36	11.24	11.21
Range	30-97	30-92	30-94	31-88
% borderline/clinical	24.74	22.61	25.16	14.38

GMM model selection. Model fit statistics for the linear GMM models for the CBCL Internalizing Behaviors subscale are presented in Table 4. Models 2-class, 3-class, 4-class, 5-class, and 6-class are significant with regards to the Bayesian Information Criterion (BIC) and bootstrap likelihood ratio test (BLRT) statistics. Unfortunately, the entropies are very low; the highest is 0.552 for 5-class model. Entropy with values approaching 1 indicate clear delineation of classes (Celeux & Soromenho, 1996). Therefore, none of the models fit the data best. It is recommended to use latent growth modeling/single group modeling (LGM) to investigate the predictors of group membership further.

Table 4. Internalizing Behavior Trajectories – GMM Model Fit (N=5501)

Model	Log-likelihood	Lo Mendall Rubin	BLRT	AIC	BIC	Sample size adj BIC	Entropy	Final Counts & Proportions
1-class	-58788.526	N/A	N/A	117599.053	117671.588	117636.634	N/A	(1) 1.00000
2-class	-58754.773	64.987 $p = 0.0136$	67.507 $p < 0.0001$	117537.545	117629.863	117585.376	0.411	(1) 0.31237 (2) 0.68763
3-class	-58739.187	30.008 $p = 0.0166$	31.172 $p < 0.0001$	117512.373	117624.474	117570.453	0.460	(1) 0.04097 (2) 0.27566 (3) 0.68337
4-class	-58724.443	28.386 $p = 0.8145$	29.487 $p < 0.0001$	117488.886	117620.769	117557.215	0.490	(1) 0.59676 (2) 0.26686 (3) 0.06855 (4) 0.06783
5-class	-58713.233	21.583 $p = 0.0137$	22.420 $p < 0.0001$	117472.466	117624.132	117551.045	0.552	(1) 0.04713 (2) 0.09140 (3) 0.38638 (4) 0.40629 (5) 0.06880
6-class	-58703.450	18.835 $p = 0.0446$	19.566 $p < 0.0001$	117458.901	117630.349	117547.729	0.453	(1) 0.04392 (2) 0.10204 (3) 0.04671 (4) 0.32302 (5) 0.19145 (6) 0.29286

Externalizing Behaviors

Externalizing behavior scores. CBCL externalizing behavior scores for the children at each wave of data collection are presented in Table 5. The average standard CBCL T-scores ranged from 57.73 at Wave 1 to 55.14 at Wave 5. Mean T-scores were in the normal range, with the highest score at Wave 1 (*M*=57.73). On average, 28.36% of the children had externalizing behavior in the borderline or clinical range at least one of the 4 waves, with highest number of borderline or clinical children at Wave 4.

Table 5. Externalizing CBCL T-Scores

***N*=5501**	**Wave 1 (Baseline)**	**Wave 3 (18 months post baseline)**	**Wave 4 (36 months post baseline)**	**Wave 5 (64-73 months post baseline)**
N	3763	3987	4619	3376
Missing	1738	1514	882	2125
Externalizing T-scores				
Mean	57.73	56.37	55.60	55.14
Std. Dev.	12.11	11.79	11.74	11.48
Range	30-95	30-95	30-99	30-89
% borderline/clinical	30.39	29.38	32.32	21.36

GMM model selection. Model fit statistics for the linear GMM models for the CBCL Internalizing Behaviors subscale are presented in Table 6. Models 2-class, 3-class, 4-class, 5-class, and 6-class are significant with regards to the Bayesian Information Criterion (BIC) and bootstrap likelihood ratio test (BLRT) statistics. Unfortunately, the entropies are very low; the highest is 0.604 for 3-class model. Entropy with values approaching 1 indicate clear delineation of classes (Celeux & Soromenho, 1996). Although, the 3-class model warrants further investigation, the final count and proportion of group membership, however, is still small for class 1 (0.3%). Therefore, none of the models fit the data best. It is recommended to use latent growth modeling/single group modeling (LGM) to investigate the predictors of group membership further.

Table 6. Externalizing Behavior Trajectories – GMM Model Fit (N=5501)

Model	Log-likelihood	Lo Mendall Rubin	BLRT	AIC	BIC	Sample size adj BIC	Entropy	Final Counts & Proportions
1-class	-58637.525	N/A	N/A	117297.051	117369.586	117334.632	N/A	(1) 1.00000
2-class	-58603.551	65.412 $p < 0.0001$	67.949 $p < 0.0001$	117235.101	117327.419	117282.932	0.393	(1) 0.39001 (2) 0.60999
3-class	-58573.319	58.205 $p = 0.0001$	60.463 $p < 0.0001$	117180.639	117292.739	117238.719	0.604	(1) 0.63444 (2) 0.36185 (3) 0.00370
4-class	-58551.371	109.342 $p = 0.0393$	113.583 $p < 0.0001$	117142.741	117274.625	117211.071	0.570	(1) 0.03382 (2) 0.36947 (3) 0.56676 (4) 0.02995
5-class	-58535.047	91.759 $p < 0.0001$	95.318 $p < 0.0001$	117116.095	117267.760	117194.674	0.564	(1) 0.33944 (2) 0.00408 (3) 0.12795 (4) 0.04404 (5) 0.48449
6-class	-58531.559	33.288 $p = 0.0116$	34.579 $p < 0.0001$	117115.119	117286.567	117203.947	0.482	(1) 0.25092 (2) 0.35122 (3) 0.09823 (4) 0.05764 (5) 0.00430 (6) 0.23770

Total Problematic Behaviors

Total problematic behavior scores. CBCL total problematic behavior scores for the children at each wave of data collection are presented in Table 7. The average standard CBCL T-scores ranged from 58.24 at Wave 1 to 54.92 at Wave 5. Mean T-scores were in the normal range, with the highest score at Wave 1 (*M*=58.24). On average, 28.57% of the children had externalizing behavior in the borderline or clinical range at least one of the 4 waves, with highest number of borderline or clinical children at Wave 4.

Table 7. Total CBCL T-Scores

***N*=5501**	**Wave 1 (Baseline)**	**Wave 3 (18 months post baseline)**	**Wave 4 (36 months post baseline)**	**Wave 5 (64-73 months post baseline)**
N	3763	3987	4619	3376
Missing	1738	1514	882	2125
Total Behavior T-scores				
Mean	58.24	56.37	55.63	54.92
Std. Dev.	12.19	11.79	12.11	12.07
Range	23-94	30-95	23-94	23-91
% borderline/clinical	31.21	29.38	31.58	22.11

GMM model selection. Model fit statistics for the linear GMM models for the CBCL Internalizing Behaviors subscale are presented in Table 8. Models 2-class, 3-class, 4-class, 5-class and 6-class are significant with regards to the Bayesian Information Criterion (BIC) and bootstrap likelihood ratio test (BLRT) statistics. Unfortunately, the entropies are very low; the highest is 0.576 for 3-class model. Entropy with values approaching 1 indicate clear delineation of classes (Celeux & Soromenho, 1996). Therefore, none of the models fit the data best. It is recommended to use latent growth modeling/single group modeling (LGM) to investigate the predictors of group membership further.

Table 8. Total Behavior Trajectories – GMM Mode Fit (N=5501)

Model	Log-likelihood	Lo Mendall Rubin	BLRT	AIC	BIC	Sample size adj BIC	Entropy	Final Counts & Proportions
1-class	-59125.131	N/A	N/A	118272.261	118344.797	118309.843	N/A	(1) 1.00000
2-class	-59100.725	46.989 $p = 0.1311$	48.812 $p < 0.0001$	118229.450	118321.768	118277.280	0.359	(1) 0.45569 (2) 0.54431
3-class	-59070.903	57.417 $p = 0.0018$	59.644 $p < 0.0001$	118175.806	118287.906	118233.886	0.576	(1) 0.43225 (2) 0.01430 (3) 0.55345
4-class	-59054.575	31.437 $p = 0.8095$	32.657 $p < 0.0001$	118149.149	118281.032	118217.479	0.543	(1) 0.02315 (2) 0.41951 (3) 0.54006 (4) 0.01727
5-class	-59033.746	40.102 $p = 0.0031$	41.657 $p < 0.0001$	118113.492	118265.158	118192.071	0.501	(1) 0.00568 (2) 0.33598 (3) 0.10125 (4) 0.15572 (5) 0.40137
6-class	-59027.013	12.963 $p = 0.0289$	13.466 $p < 0.0001$	118106.026	118277.474	118194.854	0.528	(1) 0.31747 (2) 0.12212 (3) 0.00453 (4) 0.16254 (5) 0.00645 (6) 0.38690

It is important to remember that determining the number of classes depends on a combination of factors in addiction to fit indices, including one's research question, parsimony, theoretical justification, and interpretability. Fit indices and tests of model fit should not be the final word in deciding on the number of classes. However, they are useful in the initial exploratory stages of analyses. Using simulations, Nylund and colleagues (2007) has determined that of all the fit indices and tests available in M*plus*, the BLRT performed the best, followed by BIC and then ABIC. Other considerations include successful convergence, high entropy value (near 1.0), no less than 1% of total count in class, and high posterior probabilities (near 1.0). Therefore, children in three problematic behavior groups did not show any distinct trajectory. As such, the next step, which is to identify the characteristics of children in distinct behavior trajectory groups, is no longer feasible.

Aim 2: Describe the characteristics of children in distinct behavior trajectory groups.

GMM analyses using the criteria of model fit found no evidence to investigate the characteristics of group membership further because there is one group to study. The characteristics for each distinct trajectory group will no longer be pursued. It is recommended for future analyses to try other model fit statistics analyses (linear, linear with time-varying covariates, quadratic, and quadratic with time-varying covariates) to improve the model fit. The descriptive characteristics of the children in this study are presented in the charts below:

Table 9. Characteristics of the Data Sample.

	Wave 1 (Baseline) (%)	**Wave 3 (18 months post baseline) (%)**	**Wave 4 (36 months post baseline) (%)**	**Wave 5 (64-73 months post baseline) (%)**
Gender:				
Male	1817 (48.29)	1965 (49.29)	2277 (49.30)	1817 (50.89)
Female	1946 (51.71)	2022 (50.71)	2342 (50.70)	1658 (49.11)
Total:	3763	3987	4619	3376
Child Race/Ethnicity:				
Black/Non-Hispanic	1110 (29.53)	1252 (31.45)	1507 (32.72)	1139 (33.82)
White/Non-Hispanic	1736 (46.18)	1788 (44.91)	2001 (43.44)	1418 (42.10)
Hispanic	629 (16.73)	667 (16.75)	794 (17.24)	604 (17.93)
Other	284 (7.56)	274 (6.88)	304 (6.60)	207 (6.15)
Total:	3759	3981	4606	3368
Type of Abuse:				
Physical	870 (25.23)	864 (23.52)	974 (22.98)	666 (21.52)
Sexual	566 (16.42)	493 (13.42)	488 (11.51)	284 (9.18)
Emotional	236 (6.84)	235 (6.40)	259 (6.11)	166 (5.40)
Physical Neglect	574 (16.65)	732 (19.92)	983 (23.19)	819 (26.50)
Neglect	898 (26.04)	998 (27.16)	1118 (26.37)	854 (27.60)
Abandonment	93 (2.70)	114 (3.10)	127 (3.00)	93 (3.00)
Moral/Legal	17 (0.50)	21 (0.57)	26 (0.61)	20 (0.64)
Educational	62 (1.80)	59 (1.60)	51 (1.20)	25 (0.80)
Exploitation	10 (0.30)	11 (0.30)	11 (0.26)	6 (0.20)
Other	122 (3.54)	147 (4.00)	202 (4.80)	161 (5.20)
Total:	3448	3674	4239	3094
Caregiver's Highest Grade Completed:				
8th Grade or less	309 (11.38)	329 (11.16)	366 (10.73)	273 (10.54)
9th Grade-11th Grade	995 (36.65)	1113 (37.75)	1317 (38.60)	1028 (39.68)

12th Grade or GED	876 (32.27)	926 (31.41)	1070 (31.36)	821 (31.69)
Vocational or Technical	194 (7.14)	214 (7.26)	235 (6.89)	161 (6.21)
Any College	341 (12.56)	366 (12.42)	424 (12.43)	308 (11.89)
Total:	2715	2948	3412	2591
Caregiver's Marital Status:				
Married	1398 (37.26)	1472 (37.25)	1714 (37.41)	1265 (37.51)
Separated	533 (14.20)	517 (13.08)	563 (12.89)	375 (11.12)
Divorced	752 (20.04)	697 (17.64)	757 (16.52)	499 (14.80)
Widowed	138 (3.68)	132 (3.34)	149 (3.25)	95 (2.81)
Never Married	931 (24.81)	1134 (28.70)	1399 (30.53)	1138 (33.75)
Total:	3752	3952	4582	3372
Caregiver's Current Employment Status:				
Work full-time 35 or more hours/week	1612 (44.38)	1586 (41.52)	1760 (39.85)	1202 (37.16)
Work part-time less than 35 hours/week	393 (10.82)	422 (11.05)	515 (11.66)	382 (11.81)
Work sometimes, when work is available	127 (3.50)	124 (3.25)	134 (3.03)	106 (3.28)
Does not work	1500 (41.30)	1688 (44.19)	2007 (45.45)	1545 (47.76)
Total:	3632	3820	4416	3235
Caregiver is the Biological Parent:				
Yes	2419 (64.28)	2543 (64.20)	2858 (62.26)	2143 (63.50)
No	1344 (35.72)	1418 (35.80)	1732 (37.73)	1232 (36.50)
Total:	3763	3961	4590	3375

Wave 1. About 51.71% were female children in Wave 1. Most of the children were White/Non-Hispanic (46.18%). The type of maltreatment reported were mostly neglect (26.04%) and physical abuse (25.23%). Most of the caregiver completed 9th Grade-11th Grade (36.65%) level of education and are married (37.26%). About 44.38% of caregivers work full-time 35 or more hours a week. Most of them are the biological parent of the child (64.28%).

Wave 3. About 50.71% were female children in Wave 3. Most of the children were White/Non-Hispanic (44.91%). The type of maltreatment reported were mostly neglect (27.16%) and physical abuse (23.52%). Most of the caregiver completed 9th Grade-11th Grade (37.75%) level of education and are married (37.25%). About 41.52% of caregivers work full-time 35 or more hours a week. Most of them are the biological parent of the child (64.20%).

Wave 4. About 50.70% were female children in Wave 4. Most of the children were White/Non-Hispanic (43.44%). The type of maltreatment reported were mostly neglect (26.37%) and physical abuse (22.983%). Most of the caregiver completed 9th Grade-11th Grade (39.68%) level of education and are married (37.41%). About 39.85% of caregivers work full-time 35 or more hours a week. Most of them are the biological parent of the child (62.26%).

Wave 5. About 50.89% were male children in Wave 5. Most of the children were White/Non-Hispanic (42.10%). The type of maltreatment reported were mostly neglect (27.60%) and physical neglect (26.50%). Most of the caregiver completed 9th Grade-11th Grade (36.65%) level of education and are married (37.51%). About 37.16% of caregivers work full-time 35 or more hours a week. Most of them are the biological parent of the child (63.50%).

The characteristics of the environmental factors are listed in Table 10. The total number of social workers in a certain geographic region is essential in making sure that children in the welfare system receive appropriate services. The number of social assistance establishments also determines whether a geographical area has accessible social services for families to obtain help.

Table 10. Descriptive Statistics of Environmental Factors of the Sample.

	N	**Minimum**	**Maximum**	**Mean**	**Std. Dev.**
Percentage of Households living <150% FDL	5501	0.064	0.400	0.216	0.0641
Population of Children in Juvenile Corrections	5501	0	5601	479.49	1141.383
Total Social Workers	5501	0	18185	2539.62	4471.686
Number of Social Assistance Establishments	5501	4	3059	451.42	692.350

Aim 3: Explore the predictors (child, parent/caregiver, and environmental) for the intercept and slope of growth trajectory of the three behavioral problem groups.

The relationship between factors (child, caregiver/parent, and environmental) and behavioral trajectories were tested by entering 25 independent variables separately into several multinomial logistic models. Multinomial logistic regression analyses using M*plus* 7.4 were conducted to identify the effects of hypothesized predictors on the behavioral trajectories. Individual variables were explored separately to check the significance. Significant individual predictors were then explored relative to other predictors of the same level. Significant predictors from the intermediate models were selected and included for the final model. Factors for internalizing behavior trajectories were analyzed first, then followed by externalizing behavior trajectories, and lastly, the total problematic behavior trajectories. The results are summarized below.

Internalizing Behavior

Table 11.1. Gender versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Gender				
Initial Status				
Male	1.088	0.326	3.341	0.001
Growth				
Male	-0.044	0.124	-0.353	0.724
Intercept				
I	54.590	0.239	228.331	0.000
S	-1.003	0.117	-8.591	0.000
Residual Variances				
I	76.628	2.903	26.393	0.000
S	4.897	0.751	6.523	0.000

Being a male child is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. At the initial status, the effect of male gender on the internalizing behavior trajectory is 1.088. The average internalizing score, in the beginning is 54.590 for

female children, and 53.502 (54.590 - 1.088) for male children. The average growth rate (slope) is -1.003, indicating that children tend to decrease in their internalizing behavior by 1.003 units on average per interval. The variance of intercept and growth are 76.628 and 4.897, which suggests that both factors vary significantly among this group of children.

Table 11.2. Child Ethnicity versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Ethnicity				
Initial Status				
White/non-Hispanic	0.824	0.379	2.175	0.030
Growth				
White/non-Hispanic	0.376	0.142	2.646	0.008
Intercept				
I	54.580	0.300	182.158	0.000
S	-1.175	0.136	-8.632	0.000
Residual Variances				
I	76.682	2.883	26.597	0.000
S	4.730	0.732	6.462	0.000

A White/non-Hispanic child is a significant predictor for the intercept and slope of growth trajectory. At the initial status, the effect of ethnicity on the internalizing behavior trajectory is 0.824 at a rate of 0.376, indicating that the rate of decline in internalizing behavior is slower for this group over time. The average internalizing score initially is 54.580 for Black/non-Hispanic, and 53.756 (54.580 – 0.824) for White/non-Hispanic children. The average growth rate (slope) is -1.175, indicating that children tend to decrease in their internalizing behavior by 1.175 units on average per interval. The variance of intercept and growth are 76.682 and 4.730, which suggests that both factors vary significantly among this group of children.

Table 11.3. Child Age versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Child Age				
Initial Status				
Child Age	0.237	0.037	6.470	0.000
Growth				

Child Age	-0.009	0.015	-0.623	0.533
Intercept				
I	53.542	0.305	175.391	0.000
S	-0.853	0.132	-6.484	0.000
Residual Variances				
I	75.286	2.885	26.095	0.000
S	4.737	0.773	6.130	0.000

The child's age is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. At the initial status, the effect of age on the internalizing behavior trajectory is 0.237. The average growth rate (slope) is -0.853, indicating that children tend to decrease in their internalizing behavior by 0.853 unit on average per interval. The variance of intercept and growth are 75.286 and 2.885, which suggests both factors vary significantly among this group of children.

Table 11.4. Child Social Skills versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Social Skills				
Initial Status				
Low Social Skill	5.893	0.348	16.931	0.000
Growth				
Low Social Skill	-0.584	0.151	-3.859	0.000
Intercept				
I	53.408	0.194	274.943	0.000
S	-0.812	0.091	-8.963	0.000
Residual Variances				
I	69.823	2.794	24.995	0.000
S	5.204	0.798	6.519	0.000

A child with low social skill is a significant predictor for the intercept and slope of growth trajectory. At the initial status, the effect of social skill on the internalizing behavior trajectory is 5.893 at a rate of -0.584. The average internalizing score initially is 53.408 for children with high social skills, and 47.515 (53.408 – 5.893) for children with low social skills. The average growth rate (slope) is -0.812, indicating that children tend to decrease in their internalizing behavior by 0.812 unit on average per interval. The variance of intercept and

growth are 69.823 and 5.204, which suggests that both factors vary significantly among this group of children.

Table 11.5. Types of Maltreatment versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Type of Maltreatment				
Initial Status				
Sexual Abuse	1.203	0.542	2.220	0.026
Growth				
Physical Neglect	-0.436	0.177	-2.464	0.014
Intercept				
I	55.076	0.305	180.438	0.000
S	-0.866	0.136	-6.354	0.000
Residual Variances				
I	76.603	2.881	26.594	0.000
S	4.770	0.738	6.461	0.000

Sexual abuse is a significant predictor for the intercept growth of the trajectory, but not for the slope of growth. At the initial status, the effect of sexual abuse type of maltreatment on the internalizing behavior trajectory is 1.203. The physical neglect type of maltreatment is a significant predictor for the slope of growth. The average internalizing score initially is 55.076 for children who were physically abused, and 53.873 for children who have been sexually abused. The average growth rate (slope) is -0.866, indicating that children tend to decrease in their internalizing behavior by 0.866 unit on average per interval. The variance of intercept and growth are 76.603 and 4.770, which suggests that both factors vary significantly among this group of children.

Table 11.6. Exposure to Violence versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Total Exposure to Violence				
Initial Status				
Mild/Severe Violence	0.311	0.086	3.597	0.000
Growth				
Mild/Severe Violence	0.011	0.039	0.282	0.778
Intercept				

I	54.185	0.397	136.567	0.000
S	-1.130	0.188	-6.001	0.000
Residual Variances				
I	83.637	4.172	20.047	0.000
S	6.483	1.411	4.596	0.000

Exposure to mild/severe violence is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. At the initial status, the effect of mild/severe violence exposure on the internalizing behavior trajectory is 0.311. The average growth rate (slope) is -1.130, indicating that children tend to decrease in their internalizing behavior by 1.130 units on average per interval. The variance of intercept and growth are 83.637 and 6.483, which suggests that both factors vary significantly among this group of children.

Table 11.7. Risk Factors versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Total Number of Risk Factors				
Initial Status				
One Risk	1.173	0.457	2.567	0.010
Three Risks	1.839	0.472	3.895	0.000
Growth				
One Risk	-0.385	0.181	-2.129	0.033
Three Risks	0.061	0.183	0.333	0.739
Intercept				
I	54.324	0.296	183.752	0.000
S	-0.963	0.132	-7.312	0.000
Residual Variances				
I	76.636	2.916	26.283	0.000
S	4.991	0.753	6.631	0.000

Having one and three risk factors are significant predictor for the intercept of growth trajectory, and having one risk factor is a significant predictor for the slope of growth. The average growth rate (slope) is -0.963, indicating that children tend to decrease in their internalizing behavior by 0.963 unit on average per interval. The variance of intercept and growth are 76.636 and 4.991, which suggests that both factors vary significantly among this group of children.

Table 11.8. Child Physical Health versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Child Physical Health				
Initial Status				
Very Good	2.663	0.388	6.861	0.000
Good	4.975	0.441	11.282	0.000
Fair	7.843	0.649	12.082	0.000
Poor	10.770	1.544	6.975	0.000
Growth				
Very Good	-0.283	0.164	-1.722	0.085
Good	-0.867	0.191	-4.548	0.000
Fair	-1.401	0.283	-4.944	0.000
Poor	-2.303	0.666	-3.459	0.001
Intercept				
I	52.739	0.247	213.152	0.000
S	-0.720	0.106	-6.787	0.000
Residual Variances				
I	70.990	2.846	24.944	0.000
S	5.416	0.782	6.923	0.000

Child physical health is a significant predictor for the intercept and slope of growth trajectory. The average growth rate (slope) is -0.720, indicating that children tend to decrease in their internalizing behavior by 0.720 unit on average per interval. The variance of intercept and growth are 70.990 and 5.416, which suggests that both factors vary significantly among this group of children.

Table 11.9. Cognitive Disability versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Cognitive Disability				
Initial Status				
Yes	-0.232	0.538	-0.430	0.667
Growth				
Yes	0.510	0.204	2.496	0.013
Intercept				
I	55.146	0.185	298.046	0.000
S	-1.064	0.101	-10.553	0.000
Residual Variances				
I	76.968	2.897	26.570	0.000
S	4.857	0.740	6.561	0.000

Having a cognitive disability is a significant predictor for the slope of growth trajectory, but not for the intercept. The average growth rate (slope) is -1.064, indicating that children tend to decrease in their internalizing behavior by 1.064 units on average per interval. The variance of intercept and growth are 76.968 and 4.857, which suggests that both factors vary significantly among this group of children.

Table 11.10. Caregiver/parent Age versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Age Bracket				
Initial Status				
>55 years old	-1.940	0.749	-2.591	0.010
Growth				
>55 years old	0.424	0.289	1.466	0.143
Intercept				
I	55.356	0.374	147.936	0.000
S	-1.121	0.159	-7.039	0.000
Residual Variances				
I	76.692	2.907	26.380	0.000
S	4.948	0.754	6.563	0.000

Caregivers who are over 55 years old are significant predictor for the intercept of growth trajectory, but not for the slope of growth. The average rate (slope) is -1.121, indicating that children tend to decrease in their internalizing behavior by 1.121 units on average per interval. The variance of intercept and growth are 76.692 and 4.948, which suggests that both factors vary significantly among this group of children.

Table 11.11. Caregiver Educational Level versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Highest Educational Level				
Initial Status				
High School	-1.613	0.380	-4.247	0.000
Associate	-1.581	0.710	-2.227	0.026
Masters	3.168	1.195	2.651	0.008
Growth				
High School	0.198	0.144	1.375	0.169
Associate	-0.003	0.278	-0.012	0.990

Masters	-0.516	0.500	-1.032	0.302
Intercept				
I	56.147	0.317	177.056	0.000
S	-1.145	0.138	-8.324	0.000
Residual Variances				
I	76.200	2.889	26.376	0.000
S	4.875	0.748	6.520	0.000

Caregivers/parents who have obtained high school diploma, associate degree, and master's degree are significant predictors for the intercept of growth trajectory, but not for the slope of growth. The average rate (slope) is -1.145, indicating that children tend to decrease in their internalizing behavior by 1.145 units on average per interval. The variance of intercept and growth are 76.200 and 4.875, which suggests that both factors vary significantly among this group of children.

Table 11.12. Family Income versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Total Annual Family Income				
Initial Status				
$10,000-$19,999	-0.684	0.440	-1.556	0.120
Growth				
$10,000-$19,999	-0.032	0.168	-0.188	0.851
Intercept				
I	55.617	0.309	180.083	0.000
S	-1.015	0.136	-7.482	0.000
Residual Variances				
I	76.876	2.907	26.447	0.000
S	4.914	0.751	6.546	0.000

Family income is not a significant predictor for the intercept and slope of growth trajectory. But on average, the rate (slope) is -1.015, indicating that children tend to decrease in their internalizing behavior by 1.015 units on average per interval. The variance of intercept and growth are 76.876 and 4.914, which suggests that both factors vary significantly among this group of children.

Table 11.13. Marital Status versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Marital Status				
Initial Status				
Never Married	-0.422	0.523	-0.807	0.420
Growth				
Never Married	-0.311	0.154	-2.023	0.043
Intercept				
I	55.269	0.276	200.243	0.000
S	-1.017	0.129	-7.917	0.000
Residual Variances				
I	76.917	2.909	26.443	0.000
S	4.871	0.744	6.545	0.000

Never been married caregiver/parent is a significant predictor for the slope of growth trajectory, but not for the intercept. The average growth rate (slope) is -1.017, indicating that children tend to decrease in their internalizing behavior by 1.017 units on average per interval. The variance of intercept and growth are 76.917 and 4.871, which suggests that both factors vary significantly among this group of children.

Table 11.14. Employment Status versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Employment Status				
Initial Status				
Does Not Work	1.497	0.352	4.252	0.000
Growth				
Does Not Work	-0.314	0.138	-2.274	0.023
Intercept				
I	54.466	0.249	218.875	0.000
S	-0.876	0.112	-7.816	0.000
Residual Variances				
I	76.525	2.904	26.351	0.000
S	4.975	0.752	6.619	0.000

Caregiver/parent who does not work is a significant predictor for intercept and slope of growth trajectory. The average growth rate (slope) is -0.876, indicating that children tend to decrease in their internalizing behavior by 0.876 unit on average per interval. The variance of

intercept and growth are 76.525 and 4.975, which suggests that both factors vary significantly among this group of children.

Table 11.15. Number of Household Children versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Total Number of Children in the Household				
Initial Status				
Two Children	0.248	0.446	0.556	0.578
Growth				
Two Children	-0.079	0.173	-0.459	0.647
Intercept				
I	55.205	0.317	174.365	0.000
S	-1.017	0.138	-7.344	0.000
Residual Variances				
I	77.010	2.917	26.400	0.000
S	4.946	0.760	6.508	0.000

The number of children in the household is not a significant predictor for the intercept and slope of growth trajectory. But on average, the rate (slope) is -1.017, indicating that children tend to decrease in their internalizing behavior by 1.017 units on average per interval. The variance of intercept and growth are 77.010 and 4.946, which suggests that both factors vary significantly among this group of children.

Table 11.16. Living Situation versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Child Living Situation				
Initial Status				
Out-of-home Care	1.076	0.379	2.838	0.005
Growth				
Out-of-home Care	-0.043	0.145	-0.297	0.767
Intercept				
I	54.860	0.197	278.112	0.000
S	-1.023	0.102	-10.061	0.000
Residual Variances				
I	76.729	2.908	26.390	0.000
S	4.961	0.755	6.570	0.000

Living in out-of-home care is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. At the initial status, the effect of living out-of-home on the internalizing behavior trajectory is 1.076. The average internalizing score, in the beginning is 54.860 for children who stay at home, and 53.784 (54.860 - 1.076) for children living out-of-home. The average growth rate (slope) is -1.023, indicating that children tend to decrease in their internalizing behavior by 1.023 units on average per interval. The variance of intercept and growth are 76.729 and 4.961, which suggests that both factors vary significantly among this group of children.

Table 11.17. Relationship to the Child versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Biological Parent of the Child				
Initial Status				
No	0.255	0.340	0.752	0.452
Growth				
No	0.087	0.130	0.671	0.502
Intercept				
I	55.032	0.214	256.635	0.000
S	-1.057	0.109	-9.677	0.000
Residual Variances				
I	76.976	2.909	26.460	0.000
S	4.922	0.751	6.552	0.000

Being the biological parent of the child is not a significant predictor for the intercept and slope of growth trajectory. But on average, the rate (slope) is -1.057, indicating that children tend to decrease in their internalizing behavior by 1.057 units on average per interval. The variance of intercept and growth are 76.976 and 4.922, which suggests that both factors vary significantly among this group of children.

Table 11.18. Number of Days out of Home versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Cumulative Number of Days out of Home				
Initial Status				

Number of Days	0.001	0.000	4.322	0.000
Growth				
Number of Days	0.000	0.000	-0.522	0.601
Intercept				
I	54.707	0.199	275.225	0.000
S	-1.027	0.101	-10.160	0.000
Residual Variances				
I	76.541	2.901	26.385	0.000
S	4.993	0.755	6.618	0.000

The total number of days out of home is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is -1.027, indicating that children tend to decrease in their internalizing behavior by 1.027 units on average per interval. The variance of intercept and growth are 76.541 and 4.993, which suggests that both factors vary significantly among this group of children.

Table 11.19. Social Support Satisfaction versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Social Support Satisfaction Score				
Initial Status				
Social Support Satisfaction	-2.449	0.330	-7.432	0.000
Growth				
Social Support Satisfaction	0.360	0.126	2.852	0.004
Intercept				
I	63.085	1.138	55.427	0.000
S	-2.216	0.463	-4.791	0.000
Residual Variances				
I	80.414	3.306	24.322	0.000
S	4.634	0.779	5.951	0.000

Social support satisfaction score is a significant predictor for intercept and slope of growth trajectory. The average growth rate (slope) is -2.216, indicating that children tend to decrease in their internalizing behavior by 2.216 units on average per interval. The variance of intercept and growth are 80.414 and 4.634, which suggests that both factors vary significantly among this group of children.

Table 11.20. Perception of Neighborhood versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Perception of Neighborhood				
Initial Status				
Perception	0.252	0.039	6.511	0.000
Growth				
Perception	-0.025	0.015	-1.688	0.091
Intercept				
I	51.718	0.545	94.826	0.000
S	-0.681	0.213	-3.193	0.000
Residual Variances				
I	76.224	2.892	26.360	0.000
S	4.958	0.756	6.557	0.000

Caregiver/parent's perception of the neighborhood is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is -0.681, indicating that children tend to decrease in their internalizing behavior by 0.681 unit on average per interval. The variance of intercept and growth are 76.224 and 4.958, which suggests that both factors vary significantly among this group of children.

Table 11.21. Percentage of Household Living <150% FDL versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Broader Environmental Characteristics:				
Percentage of Household living <150% FDL				
Initial Status				
Percentage	-3.517	2.528	-1.391	0.164
Growth				
Percentage	1.191	0.987	1.206	0.228
Intercept				
I	55.890	0.578	96.670	0.000
S	-1.285	0.243	-5.285	0.000
Residual Variances				
I	76.957	2.909	26.454	0.000
S	4.941	0.753	6.558	0.000

The percentage of household living in poverty is not a significant predictor for the intercept and slope of growth trajectory. But on average, the rate (slope) is -1.285, indicating that children tend to decrease in their internalizing behavior by 1.285 units on average per

interval. The variance of intercept and growth are 76.957 and 4.941, which suggests that both factors vary significantly among this group of children.

Table 11.22. Population of Children in Juvenile Corrections versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Broader Environmental Characteristics:				
Population of Children in Juvenile Corrections				
Initial Status				
Population of Juvenile	-0.001	0.000	-3.543	0.000
Growth				
Population of Juvenile	0.000	0.000	0.393	0.695
Intercept				
I	55.367	0.189	292.188	0.000
S	-1.031	0.102	-10.069	0.000
Residual Variances				
I	76.684	2.901	26.431	0.000
S	4.926	0.754	6.533	0.000

Population of children in juvenile corrections is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is -1.031, indicating that children tend to decrease in their internalizing behavior by 1.031 units on average per interval. The variance of intercept and growth are 76.684 and 4.926, which suggests that both factors vary significantly among this group of children.

Table 11.23. Number of Social Workers versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Broader Environmental Characteristics:				
Total Number of Social Workers				
Initial Status				
Number of Social Workers	0.000	0.000	-4.242	0.000
Growth				
Number of Social Workers	0.000	0.000	1.233	0.218
Intercept				
I	55.528	0.201	275.957	0.000
S	-1.077	0.109	-9.857	0.000
Residual Variances				
I	76.585	2.909	26.323	0.000
S	5.008	0.766	6.542	0.000

The total number of social workers is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is -1.077, indicating that children tend to decrease in their internalizing behavior by 1.077 units on average per interval. The variance of intercept and growth are 76.585 and 5.008, which suggests that both factors vary significantly among this group of children.

Table 11.24. Social Assistance Establishments versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Broader Environmental Characteristics:				
Number of Social Assistance Establishment				
Initial Status				
Number of Establishment	-0.001	0.000	-4.260	0.000
Growth				
Number of Establishment	0.000	0.000	0.781	0.435
Intercept				
I	55.579	0.207	267.951	0.000
S	-1.056	0.111	-9.55	0.000
Residual Variances				
I	76.530	2.902	26.368	0.000
S	4.960	0.760	6.523	0.000

The number of social assistance establishments is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is -1.056, indicating that children tend to decrease in their internalizing behavior by 1.056 units on average per interval. The variance of intercept and growth are 76.530 and 4.960, which suggests that both factors vary significantly among this group of children.

Table 11.25. Proportion of Ethnicity versus Internalizing Behavior Trajectory

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Broader Environmental Characteristics:				
Proportion Total Population				
Initial Status				
White (Non-Hispanic)	4.309	1.582	-4.260	0.000
Growth				
White (Non-Hispanic)	0.104	0.642	0.162	0.871
Intercept				
I	52.151	1.510	34.532	0.000
S	-1.275	0.622	-2.051	0.040

Residual Variances				
I	76.597	2.934	26.103	0.000
S	5.247	0.801	6.552	0.000

The proportion of White/Non-Hispanic in the total population is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is -1.275, indicating that children tend to decrease in their internalizing behavior by 1.275 units on average per interval. The variance of intercept and growth are 76.597 and 5.247, which suggests that both factors vary significantly among this group of children.

Table 11.26. Child Level Predictors versus Internalizing Behavior Trajectory Intermediate Model

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-Value**
Child Level Predictors Only:				
Initial Status				
Male	2.210	0.420	5.261	0.000
White/Non-Hispanic	1.578	0.461	3.423	0.001
Hispanic	1.000	0.610	1.639	0.101
Child Age	0.445	0.071	6.249	0.000
Low Social Skill	7.239	0.435	16.628	0.000
Physical Neglect Type of Maltreatment	0.013	0.607	0.021	0.983
Exposure to Mild/Severe Violence	0.320	0.051	6.341	0.000
Three Risk Factors	1.669	0.543	3.073	0.002
Diagnosed with Cognitive Disability	-0.899	0.859	-1.046	0.296
Poor Physical Health	12.629	2.346	5.383	0.000
Growth				
Male	-0.262	0.198	-1.325	0.185
White/Non-Hispanic	0.083	0.219	0.378	0.705
Hispanic	-0.189	0.286	-0.661	0.509
Child Age	-0.146	0.036	-4.017	0.000
Low Social Skill	-1.227	0.219	-5.591	0.000
Physical Neglect Type of Maltreatment	-0.491	0.277	-1.770	0.077
Exposure to Mild/Severe Violence	-0.011	0.024	-0.441	0.659
Three Risk Factors	0.116	0.256	0.451	0.652
Diagnosed with Cognitive Disability	1.108	0.423	2.618	0.009
Poor Physical Health	-2.802	1.166	-2.404	0.016
Intercept				
I	44.992	0.917	49.068	0.000
S	0.874	0.437	2.002	0.045
Residual Variances				
I	68.260	3.696	18.467	0.000
S	6.211	1.344	4.621	0.000

Child level significant predictors for the intercept of growth trajectory include: male children, White/non-Hispanic children, child age, local social skill children, exposed to mild/severe violence, have three risk factors, and children with poor physical health. Child level significant predictors for the slope of growth trajectory include: child age, low social skill children, diagnosed with cognitive disability, and children with poor physical health. The average growth rate (slope) is 0.874, indicating that children tend to increase in their internalizing behavior by 0.874 unit on average per interval. The variance of intercept and growth are 68.260 and 6.211, which suggests that both factors vary significantly among this group of children.

Table 11.27. Caregiver/Parental Level Predictors versus Internalizing Behavior Trajectory Intermediate Model

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-Value**
Caregiver/Parent Level Predictors Only:				
Initial Status				
Living Out of Home Situation	1.690	0.584	2.892	0.004
Caregiver/Parent – Not Biological Caregiver	-0.647	0.526	-1.230	0.219
Perception of Neighborhood	0.249	0.040	6.290	0.000
Caregiver Age >55 years old	-2.908	0.726	-4.004	0.000
Master's Degree Level of Education	4.424	1.178	3.755	0.000
Caregiver Does Not Work	1.469	0.337	4.354	0.000
Number of Days Child Living Out of Home	0.001	0.000	3.474	0.001
Growth				
Living Out of Home Situation	-0.222	0.235	-0.946	0.344
Caregiver/Parent – Not Biological Caregiver	0.153	0.213	0.719	0.472
Perception of Neighborhood	-0.020	0.016	-1.272	0.203
Caregiver Age >55 years old	0.451	0.294	1.532	0.125
Master's Degree Level of Education	-0.800	0.510	-1.567	0.117
Caregiver Does Not Work	-0.287	0.134	-2.133	0.033
Number of Days Child Living Out of Home	0.000	0.000	-0.550	0.583
Intercept				
I	50.672	0.600	84.433	0.000
S	-0.679	0.242	-2.801	0.005
Residual Variances				
I	74.498	2.881	25.859	0.000
S	5.256	0.771	6.814	0.000

Caregiver/parental level predictors for the intercept of growth trajectory include: out of home living situation, perception of neighborhood, caregivers who are over 55 years old, Master's degree level of education, caregiver who does not work, and the number of days' child living out of home. Caregiver/parental level predictor for the slope of growth trajectory includes caregivers who don't work. The average growth rate (slope) is -0.679, indicating that children tend to decrease in their internalizing behavior by 0.679 unit on average per interval. The variance of intercept and growth are 74.498 and 5.256, which suggests that both factors vary significantly among this group of children.

Table 11.28. Environmental Level Predictors versus Internalizing Behavior Trajectory Intermediate Model

Internalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-Value**
Environmental Leve Predictors Only:				
Initial Status				
Juvenile Population in Corrections	0.000	0.000	-0.375	0.708
Total Number of Social Workers	0.000	0.000	-0.806	0.420
Total Social Assistance Establishment	0.000	0.001	0.361	0.718
Proportion of White/Non-Hispanic Population	3.048	0.971	3.141	0.002
Growth				
Juvenile Population in Corrections	0.000	0.000	0.042	0.967
Total Number of Social Workers	0.000	0.000	1.711	0.087
Total Social Assistance Establishment	-0.001	0.000	-1.228	0.219
Proportion of White/Non-Hispanic Population	-0.173	0.386	-0.449	0.653
Intercept				
I	53.238	0.776	68.588	0.000
S	-0.914	0.308	-2.966	0.003
Residual Variances				
I	76.422	2.912	26.244	0.000
S	5.093	0.777	6.559	0.000

Environmental level predictor for the intercept of growth trajectory includes the proportion of White/Non-Hispanic population. There are no significant predictors for the slope of growth trajectory. The average growth rate (slope) is -0.914, indicating that children tend to

increase in their internalizing behavior by 0.914 unit on average per interval. The variance of intercept and growth are 76.422 and 5.093, which suggests that both factors vary significantly among this group of children.

Table 11.29. Internalizing Behavior Trajectory Predictors Final Model

Internalizing Behavior Trajectory Predictors	Estimate	SE	Est./SE*	p-Value
Initial Status				
Child Level:				
Male Children	2.598	0.483	5.379	0.000
White/Non-Hispanic	0.807	0.631	1.279	0.201
Hispanic	1.745	0.742	2.352	0.019
Other Ethnicity	1.078	0.971	1.110	0.267
Child Age	0.413	0.083	4.989	0.000
Low Social Skill	7.209	0.501	14.379	0.000
Sexual Abuse Type of Maltreatment	0.507	0.727	0.698	0.485
Physical Neglect Type of Maltreatment	-1.120	0.786	-1.425	0.154
Neglect Type of Maltreatment	-1.360	0.650	-2.094	0.036
Other Abuse Type of Maltreatment	-0.102	0.761	-0.134	0.894
Exposure to Mild/Severe Violence	0.261	0.060	4.346	0.000
One Risk Factor	-0.048	0.589	-0.082	0.934
Three Risk Factors	1.015	0.681	1.491	0.136
Four Risk Factors	-1.728	1.046	-1.652	0.098
Poor Physical Health	11.986	2.721	4.405	0.000
Diagnosed with Cognitive Disability	-0.698	1.008	-0.692	0.489
Caregiver/Parental Level:				
Living Out of Home Situation	-6.727	10.911	-0.617	0.538
Caregiver/Parent – Not Biological Caregiver	-0.803	0.691	-1.161	0.246
Perception of Neighborhood	0.149	0.055	2.712	0.007
Caregiver Age >55 years old	-0.713	1.676	-0.426	0.670
High School Degree Level of Education	0.053	0.486	0.108	0.914
Master's Degree Level of Education	1.563	2.626	0.595	0.552
Caregiver Does Not Work	2.088	0.497	4.201	0.000
Number of Days Child Living Out of Home	0.002	0.001	2.636	0.008
Caregiver Level of Support Satisfaction	-2.186	0.427	-5.124	0.000
Environmental Level:				
Number of Social Assistance Establishments	-0.001	0.000	-3.205	0.001
Proportion of White/Non-Hispanic Population	3.839	1.487	2.581	0.010
Growth				
Child Level:				
Male Children	-0.403	0.197	-2.040	0.041
White/Non-Hispanic	0.368	0.254	1.452	0.147
Hispanic	-0.216	0.298	-0.725	0.469
Other Ethnicity	0.165	0.420	0.393	0.694

Child Age	-0.184	0.038	-4.853	0.000
Low Social Skill	-0.958	0.211	-4.544	0.000
Sexual Abuse Type of Maltreatment	-0.431	0.302	-1.427	0.154
Physical Neglect Type of Maltreatment	-0.344	0.309	-1.113	0.266
Neglect Type of Maltreatment	-0.080	0.266	-0.300	0.764
Other Abuse Type of Maltreatment	-0.079	0.315	-0.251	0.802
Exposure to Mild/Severe Violence	-0.010	0.024	-0.433	0.665
One Risk Factor	-0.202	0.242	-0.833	0.405
Three Risk Factors	0.078	0.272	0.288	0.773
Four Risk Factors	0.597	0.431	1.387	0.166
Poor Physical Health	-1.779	1.210	-1.471	0.141
Diagnosed with Cognitive Disability	0.848	0.428	1.984	0.047
Caregiver/Parental Level:				
Living Out of Home Situation	-4.414	5.712	-0.773	0.440
Caregiver/Parent – Not Biological Caregiver	-0.018	0.284	-0.063	0.950
Perception of Neighborhood	0.007	0.023	0.319	0.750
Caregiver Age	1.695	0.723	2.344	0.019
High School Degree Level of Education	-0.137	0.198	-0.693	0.488
Master's Degree Level of Education	-1.403	1.186	-1.183	0.237
Caregiver Does Not Work	-0.363	0.202	-1.799	0.072
Number of Days Child Living Out of Home	0.000	0.000	0.047	0.962
Caregiver Level of Support Satisfaction	0.320	0.179	1.787	0.074
Environmental Level:				
Number of Social Assistance Establishments	0.000	0.000	1.663	0.096
Proportion of White/Non-Hispanic Population	-0.793	0.622	-1.276	0.202
Intercept				
I	48.198	2.397	20.105	0.000
S	0.590	1.002	0.589	0.556
Residual Variances				
I	69.627	3.877	17.959	0.000
S	4.410	0.988	4.464	0.000

Significant predictors for the intercept of growth trajectory include: male children, White/Non-Hispanic children, child age, low social skill, sexually abused children, exposed to mild/severe violence, poor physical health, caregiver's perception of the neighborhood, caregivers who don't work, the number of days' child living out of home, caregiver level of support satisfaction, the number social assistance establishments, and the proportion of White/Non-Hispanic population. Significant predictors for the slope of growth trajectory include: male children, child age, low social skill, children diagnosed with cognitive disability,

and caregivers who are over 55 years old. The average growth rate (slope) is not significant. The variance of intercept and growth are 69.627 and 4.410, which suggests that both factors vary significantly among this group of children.

Externalizing Behavior

Table 12.1. Gender versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Gender				
Initial Status				
Male	-0.086	0.347	-0.248	0.804
Growth				
Male	-0.013	0.192	-0.066	0.947
Intercept				
I	56.958	0.241	236.256	0.000
S	-0.743	0.132	-5.642	0.000
Residual Variances				
I	84.850	4.364	19.442	0.000
S	12.019	1.452	8.279	0.000

Being a male child is not a significant predictor for the intercept and slope of growth trajectory. But on average, the rate (slope) is -0.743, indicating that children tend to decrease in their externalizing behavior by 0.743 unit on average per interval. The variance of intercept and growth are 84.850 and 12.019, which suggests that both factors vary significantly among this group of children.

Table 12.2. Child Ethnicity versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Ethnicity				
Initial Status				
White/Non-Hispanic	1.145	0.402	2.849	0.004
Hispanic	-1.296	0.519	-2.498	0.012
Growth				
White/Non-Hispanic	0.061	0.220	0.276	0.783
Hispanic	-0.040	0.284	-0.140	0.889

Intercept				
I	56.656	0.309	183.290	0.000
S	-0.781	0.169	-4.629	0.000
Residual Variances				
I	83.903	4.304	19.494	0.000
S	12.125	1.451	8.356	0.000

Both White/Non-Hispanic and Hispanic children are significant predictors for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is -0.781, indicating that children tend to decrease in their externalizing behavior by 0.781 unit on average per interval. The variance of intercept and growth are 83.903 and 12.125, which suggests that both factors vary significantly among this group of children.

Table 12.3. Child Age versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Child Age				
Initial Status				
Child Age	0.575	0.039	14.570	0.000
Growth				
Child Age	-0.084	0.022	-3.768	0.000
Intercept				
I	53.062	0.328	161.557	0.000
S	0.060	0.187	0.321	0.748
Residual Variances				
I	77.397	4.461	17.350	0.000
S	11.745	1.451	8.095	0.000

The child's age is a significant predictor for the intercept and slope of growth trajectory. At the initial status, the effect of age on the externalizing behavior trajectory is 0.575. Children start with initial status of 53.062. The average growth rate (slope) is not significant. The variance of intercept and growth are 77.397 and 11.745, which suggests that both factors vary significantly among this group of children.

Table 12.4. Child Social Skills versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**

Child Characteristics:				
Social Skills				
Initial Status				
Low Social Skill	8.824	0.367	24.071	0.000
Growth				
Low Social Skill	-1.603	0.210	-7.643	0.000
Intercept				
I	54.257	0.204	266.406	0.000
S	-0.092	0.118	-0.782	0.434
Residual Variances				
I	72.398	3.715	19.486	0.000
S	11.505	1.510	7.620	0.000

A child with low social skill is a significant predictor for the intercept and slope of growth trajectory. At the initial status, the effect of social skill on the externalizing behavior trajectory is 8.824 at a rate of -1.603. The average externalizing score initially is 54.257 for children with high social skills, and 45.433 (54.257 – 8.824) for children with low social skills. The average growth rate (slope) is not significant. The variance of intercept and growth are 72.398 and 11.505, which suggests that both factors vary significantly among this group of children.

Table 12.5. Types of Maltreatment versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Type of Maltreatment				
Initial Status				
Physical Neglect	-1.954	0.514	-3.800	0.000
Neglect	-1.737	0.466	-3.723	0.000
Other Abuse	-1.933	0.549	-3.521	0.000
Growth				
Physical Neglect	0.309	0.282	1.097	0.272
Neglect	0.374	0.255	1.468	0.142
Other Abuse	0.225	0.304	0.741	0.459
Intercept				
I	57.840	0.311	185.852	0.000
S	-0.884	0.170	-5.200	0.000
Residual Variances				
I	83.607	4.331	19.306	0.000
S	12.053	1.451	8.306	0.000

Physical neglect, neglect, and other abuse are significant predictors for the intercept growth of the trajectory, but not for the slope of growth. The average growth rate (slope) is -0.884, indicating that children tend to decrease in their externalizing behavior by 0.866 unit on average per interval. The variance of intercept and growth are 83.607 and 12.053, which suggests that both factors vary significantly among this group of children.

Table 12.6. Exposure to Violence versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Total Exposure to Violence				
Initial Status				
Mild/Severe Violence	0.292	0.088	3.323	0.001
Growth				
Mild/Severe Violence	-0.002	0.048	-0.047	0.962
Intercept				
I	56.741	0.403	140.913	0.000
S	-0.665	0.217	-3.062	0.002
Residual Variances				
I	89.948	5.343	16.833	0.000
S	13.022	1.935	6.730	0.000

Exposure to mild/severe violence is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. At the initial status, the effect of mild/severe violence exposure on the externalizing behavior trajectory is 0.292. The average growth rate (slope) is -0.665, indicating that children tend to decrease in their externalizing behavior by 0.665 unit on average per interval. The variance of intercept and growth are 89.948 and 13.022, which suggests that both factors vary significantly among this group of children.

Table 12.7. Risk Factors versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Total Number of Risk Factors				
Initial Status				
One Risk	1.335	0.483	2.767	0.006
Three Risks	1.288	0.499	2.581	0.010

Growth				
One Risk	-0.452	0.264	-1.710	0.087
Three Risks	0.291	0.272	1.070	0.285
Intercept				
I	56.196	0.306	183.777	0.000
S	-0.696	0.168	-4.156	0.000
Residual Variances				
I	84.954	4.300	19.758	0.000
S	11.956	1.450	8.246	0.000

Having one and three risk factors are significant predictors for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is -0.696, indicating that children tend to decrease in their externalizing behavior by 0.696 unit on average per interval. The variance of intercept and growth are 84.954 and 11.956, which suggests that both factors vary significantly among this group of children.

Table 12.8. Child Physical Health versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Child Physical Health				
Initial Status				
Very Good	2.406	0.412	5.841	0.000
Good	3.826	0.473	8.093	0.000
Fair	5.603	0.694	8.075	0.000
Poor	8.121	1.661	4.888	0.000
Growth				
Very Good	-0.271	0.224	-1.208	0.227
Good	-0.722	0.259	-2.785	0.005
Fair	-1.217	0.378	-3.223	0.001
Poor	-2.560	0.901	-2.840	0.005
Intercept				
I	54.981	0.265	207.571	0.000
S	-0.409	0.146	-2.806	0.005
Residual Variances				
I	83.799	4.141	20.235	0.000
S	11.779	1.480	7.961	0.000

Child physical health is a significant predictor for the intercept and slope of growth trajectory. The average growth rate (slope) is -0.409, indicating that children tend to decrease in

their externalizing behavior by 0.409 unit on average per interval. The variance of intercept and growth are 83.799 and 11.779, which suggests that both factors vary significantly among this group of children.

Table 12.9. Cognitive Disability versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Cognitive Disability				
Initial Status				
Yes	-0.534	0.569	-0.939	0.348
Growth				
Yes	1.013	0.308	3.290	0.001
Intercept				
I	56.977	0.183	310.528	0.000
S	-0.852	0.099	-8.572	0.000
Residual Variances				
I	84.805	4.301	19.717	0.000
S	12.000	1.445	8.307	0.000

Having a cognitive disability is a significant predictor for the slope of growth trajectory, but not for the intercept. The average growth rate (slope) is -0.852, indicating that children tend to decrease in their externalizing behavior by 0.852 unit on average per interval. The variance of intercept and growth are 84.805 and 12.000, which suggests that both factors vary significantly among this group of children.

Table 12.10. Caregiver/parent Age versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Age Bracket				
Initial Status				
46-55 years old	2.884	0.655	4.402	0.000
Growth				
46-55 years old	-0.473	0.361	-1.310	0.190
Intercept				
I	56.018	0.398	140.648	0.000
S	-0.510	0.220	-2.318	0.020
Residual Variances				
I	83.001	4.388	18.917	0.000

S	11.932	1.460	8.173	0.000

Caregivers who are between 46-55 years old are significant predictor for the intercept of growth trajectory, but not for the slope of growth. The average rate (slope) is -0.510, indicating that children tend to decrease in their externalizing behavior by 0.510 unit on average per interval. The variance of intercept and growth are 83.001 and 11.932, which suggests that both factors vary significantly among this group of children.

Table 12.11. Caregiver Educational Level versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Highest Educational Level				
Initial Status				
High School	-0.799	0.403	-1.985	0.047
Masters	4.513	1.246	3.623	0.000
Growth				
High School	0.027	0.220	0.122	0.903
Masters	-0.926	0.677	-1.368	0.171
Intercept				
I	57.285	0.333	171.827	0.000
S	-0.714	0.181	-3.939	0.000
Residual Variances				
I	84.344	4.312	19.561	0.000
S	12.038	1.449	8.310	0.000

Caregivers/parents who have obtained high school diploma and master's degree are significant predictors for the intercept of growth trajectory, but not for the slope of growth. The average rate (slope) is -0.714, indicating that children tend to decrease in their externalizing behavior by 0.714 unit on average per interval. The variance of intercept and growth are 84.344 and 12.038, which suggests that both factors vary significantly among this group of children.

Table 12.12. Family Income versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Total Annual Family Income				
Initial Status				

$10,000-$19,999	-0.432	0.464	-0.929	0.353
Growth				
$10,000-$19,999	-0.081	0.253	-0.320	0.749
Intercept				
I	57.281	0.322	178.147	0.000
S	-0.735	0.175	-4.194	0.000
Residual Variances				
I	84.748	4.345	19.504	0.000
S	12.042	1.453	8.291	0.000

Family income is not a significant predictor for the intercept and slope of growth trajectory. But on average, the rate (slope) is -0.735, indicating that children tend to decrease in their externalizing behavior by 0.735 unit on average per interval. The variance of intercept and growth are 84.748 and 12.042, which suggests that both factors vary significantly among this group of children.

Table 12.13. Marital Status versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Marital Status				
Initial Status				
Never Married	-1.257	0.434	-2.896	0.004
Growth				
Never Married	0.088	0.238	0.372	0.710
Intercept				
I	57.177	0.281	203.212	0.000
S	-0.797	0.153	-5.202	0.000
Residual Variances				
I	84.552	4.397	19.228	0.000
S	11.906	1.448	8.223	0.000

Never been married caregiver/parent is a significant predictor for the intercept of growth trajectory, but not for slope of growth. The average growth rate (slope) is -0.797, indicating that children tend to decrease in their externalizing behavior by 0.797 unit on average per interval. The variance of intercept and growth are 84.552 and 11.906, which suggests that both factors vary significantly among this group of children.

Table 12.14. Employment Status versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Employment Status				
Initial Status				
Does Not Work	0.631	0.372	1.697	0.090
Growth				
Does Not Work	-0.375	0.203	-1.849	0.064
Intercept				
I	56.739	0.257	220.633	0.000
S	-0.551	0.140	-3.927	0.000
Residual Variances				
I	84.781	4.310	19.673	0.000
S	11.993	1.448	8.280	0.000

Employment status is not a significant predictor for the intercept and slope of growth trajectory. But on average, the rate (slope) is -0.551, indicating that children tend to decrease in their externalizing behavior by 0.551 unit on average per interval. The variance of intercept and growth are 84.781 and 11.993, which suggests that both factors vary significantly among this group of children.

Table 12.15. Number of Household Children versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Total Number of Children in the Household				
Initial Status				
Two Children	0.203	0.471	0.432	0.666
Growth				
Two Children	-0.186	0.258	-0.721	0.471
Intercept				
I	56.912	0.330	172.289	0.000
S	-0.680	0.181	-3.750	0.000
Residual Variances				
I	84.740	4.322	19.607	0.000
S	11.997	1.451	8.271	0.000

The number of children in the household is not a significant predictor for the intercept and slope of growth trajectory. But on average, the rate (slope) is -0.680, indicating that children

tend to decrease in their externalizing behavior by 0.680 unit on average per interval. The variance of intercept and growth are 84.740 and 11.997, which suggests that both factors vary significantly among this group of children.

Table 12.16. Living Situation versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Child Living Situation				
Initial Status				
Out-of-home Care	1.302	0.401	3.246	0.001
Growth				
Out-of-home Care	0.010	0.219	0.046	0.964
Intercept				
I	56.588	0.201	282.079	0.000
S	-0.763	0.109	-6.976	0.000
Residual Variances				
I	84.303	4.371	19.286	0.000
S	11.953	1.452	8.234	0.000

Living in out-of-home care is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. At the initial status, the effect of living out-of-home on the externalizing behavior trajectory is 1.302. The average externalizing score, in the beginning is 56.588 for children who stay at home, and 55.286 (56.588 - 1.302) for children living out-of-home. The average growth rate (slope) is -0.763, indicating that children tend to decrease in their externalizing behavior by 0.763 unit on average per interval. The variance of intercept and growth are 84.303 and 11.953, which suggests that both factors vary significantly among this group of children.

Table 12.17. Relationship to the Child versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Biological Parent of the Child				
Initial Status				
No	0.442	0.362	1.219	0.223
Growth				

No	0.331	0.198	1.673	0.094
Intercept				
I	56.756	0.219	259.212	0.000
S	-0.873	0.118	-7.369	0.000
Residual Variances				
I	85.466	4.400	19.425	0.000
S	11.866	1.450	8.186	0.000

Being the biological parent of the child is not a significant predictor for the intercept and slope of growth trajectory. But on average, the rate (slope) is -0.873, indicating that children tend to decrease in their externalizing behavior by 0.873 unit on average per interval. The variance of intercept and growth are 85.466 and 11.866, which suggests that both factors vary significantly among this group of children.

Table 12.18. Number of Days out of Home versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Cumulative Number of Days out of Home				
Initial Status				
Number of Days	0.001	0.000	4.531	0.000
Growth				
Number of Days	0.000	0.000	-0.632	0.527
Intercept				
I	56.444	0.202	279.470	0.000
S	-0.733	0.111	-6.604	0.000
Residual Variances				
I	84.163	4.297	19.586	0.000
S	12.027	1.451	8.286	0.000

The total number of days out of home is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is -0.733, indicating that children tend to decrease in their externalizing behavior by 0.733 unit on average per interval. The variance of intercept and growth are 84.163 and 12.027, which suggests that both factors vary significantly among this group of children.

Table 12.19. Social Support Satisfaction versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Social Support Satisfaction Score				
Initial Status				
Social Support Satisfaction	-2.442	0.353	-6.918	0.000
Growth				
Social Support Satisfaction	0.551	0.176	3.131	0.002
Intercept				
I	64.815	1.210	53.547	0.000
S	-2.596	0.613	-4.236	0.000
Residual Variances				
I	94.334	4.410	21.393	0.000
S	9.222	1.627	5.667	0.000

Social support satisfaction score is a significant predictor for intercept and slope of growth trajectory. The average growth rate (slope) is -2.596, indicating that children tend to decrease in their externalizing behavior by 2.596 units on average per interval. The variance of intercept and growth are 94.334 and 9.222, which suggests that both factors vary significantly among this group of children.

Table 12.20. Perception of Neighborhood versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Perception of Neighborhood				
Initial Status				
Perception	0.286	0.040	7.082	0.000
Growth				
Perception	-0.042	0.022	-1.902	0.057
Intercept				
I	53.031	0.571	92.942	0.000
S	-0.179	0.314	-0.571	0.568
Residual Variances				
I	82.435	4.288	19.223	0.000
S	12.034	1.446	8.323	0.000

Caregiver/parent's perception of the neighborhood is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is

not significant. The variance of intercept and growth are 82.435 and 12.034, which suggests that both factors vary significantly among this group of children.

Table 12.21. Percentage of Household Living <150% FDL versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Broader Environmental Characteristics:				
Percentage of Household living <150% FDL				
Initial Status				
Percentage	-2.089	2.663	-0.784	0.433
Growth				
Percentage	1.526	1.461	1.045	0.296
Intercept				
I	57.368	0.603	95.137	0.000
S	-1.080	0.331	-3.267	0.001
Residual Variances				
I	84.888	4.332	19.595	0.000
S	12.016	1.449	8.291	0.000

The percentage of household living in poverty is not a significant predictor for the intercept and slope of growth trajectory. But on average, the rate (slope) is -1.080, indicating that children tend to decrease in their externalizing behavior by 1.080 units on average per interval. The variance of intercept and growth are 84.888 and 12.016, which suggests that both factors vary significantly among this group of children.

Table 12.22. Population of Children in Juvenile Corrections versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Broader Environmental Characteristics:				
Population of Children in Juvenile Corrections				
Initial Status				
Population of Juvenile	-0.001	0.000	-5.264	0.000
Growth				
Population of Juvenile	0.000	0.000	0.406	0.685
Intercept				
I	57.293	0.188	305.531	0.000
S	-0.762	0.102	-7.467	0.000
Residual Variances				
I	83.846	4.311	19.450	0.000

S	12.092	1.452	8.329	0.000

Population of children in juvenile corrections is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is -0.762, indicating that children tend to decrease in their externalizing behavior by 0.762 unit on average per interval. The variance of intercept and growth are 83.846 and 12.092, which suggests that both factors vary significantly among this group of children.

Table 12.23. Number of Social Workers versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Broader Environmental Characteristics:				
Total Number of Social Workers				
Initial Status				
Number of Social Workers	0.000	0.000	-5.766	0.000
Growth				
Number of Social Workers	0.000	0.000	1.670	0.095
Intercept				
I	57.475	0.199	289.268	0.000
S	-0.831	0.108	-7.700	0.000
Residual Variances				
I	84.244	4.271	19.724	0.000
S	12.244	1.451	8.439	0.000

The total number of social workers is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is -0.831, indicating that children tend to decrease in their externalizing behavior by 0.831 unit on average per interval. The variance of intercept and growth are 84.244 and 12.244, which suggests that both factors vary significantly among this group of children.

Table 12.24. Social Assistance Establishments versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Broader Environmental Characteristics:				
Number of Social Assistance Establishment				
Initial Status				
Number of Establishment	-0.002	0.000	-6.069	0.000
Growth				

Number of Establishment	0.000	0.000	1.088	0.277
Intercept				
I	57.590	0.206	279.889	0.000
S	-0.808	0.112	-7.210	0.000
Residual Variances				
I	83.995	4.271	19.667	0.000
S	12.239	1.452	8.429	0.000

The number of social assistance establishments is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is -0.808, indicating that children tend to decrease in their externalizing behavior by 0.808 unit on average per interval. The variance of intercept and growth are 83.995 and 12.239, which suggests that both factors vary significantly among this group of children.

Table 12.25. Proportion of Ethnicity versus Externalizing Behavior Trajectory

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Broader Environmental Characteristics:				
Proportion Total Population				
Initial Status				
White (Non-Hispanic)	7.052	1.653	4.265	0.000
Black (Non-Hispanic)	1.774	1.995	0.889	0.374
Growth				
White (Non-Hispanic)	0.771	0.925	0.833	0.405
Black (Non-Hispanic)	3.019	1.111	2.718	0.007
Intercept				
I	51.794	1.574	32.898	0.000
S	-1.859	0.881	-2.109	0.035
Residual Variances				
I	83.738	4.274	19.591	0.000
S	12.090	1.445	8.366	0.000

The proportion of White (Non-Hispanic) in the total population is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. However, Black (Non-Hispanic) is a significant predictor of the slope of growth trajectory. The average growth rate (slope) is -1.859, indicating that children tend to decrease in their externalizing behavior by

1.859 units on average per interval. The variance of intercept and growth are 83.738 and 12.090, which suggests that both factors vary significantly among this group of children.

Table 12.26. Child Level Predictors versus Externalizing Behavior Trajectory Intermediate Model

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-Value**
Child Level Predictors Only:				
Initial Status				
White/Non-Hispanic	1.134	0.461	2.463	0.014
Hispanic	-1.976	0.609	-3.242	0.001
Child Age	0.661	0.070	9.373	0.000
Low Social Skill	9.184	0.439	20.933	0.000
Exposure to Mild/Severe Violence	0.322	0.050	6.394	0.000
Three Risk Factors	0.764	0.541	1.413	0.158
Diagnosed with Cognitive Disability	-0.843	0.853	-0.989	0.323
Poor Physical Health	8.363	2.334	3.582	0.000
Growth				
White/Non-Hispanic	-0.382	0.264	-1.449	0.147
Hispanic	-0.167	0.348	-0.480	0.631
Child Age	-0.107	0.041	-2.602	0.009
Low Social Skill	-2.112	0.253	-8.337	0.000
Exposure to Mild/Severe Violence	-0.047	0.029	-1.632	0.103
Three Risk Factors	0.630	0.311	2.026	0.043
Diagnosed with Cognitive Disability	1.353	0.486	2.785	0.005
Poor Physical Health	-1.962	1.309	-1.499	0.134
Intercept				
I	46.639	0.873	53.445	0.000
S	1.293	0.516	2.504	0.012
Residual Variances				
I	69.908	4.239	16.492	0.000
S	11.420	2.009	5.684	0.000

Child level significant predictors for the intercept of growth trajectory include: White/Non-Hispanic children as well as Hispanic children, child age, local social skill children, exposed to mild/severe violence, and children with poor physical health. Child level significant predictors for the slope of growth trajectory include: child age, low social skill children, diagnosed with cognitive disability, and children with poor physical health. The average growth rate (slope) is 1.293, indicating that children tend to increase in their externalizing behavior by

1.293 units on average per interval. The variance of intercept and growth are 69.908 and 11.420, which suggests that both factors vary significantly among this group of children.

Table 12.27. Caregiver/Parental Level Predictors versus Externalizing Behavior Trajectory Intermediate Model

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-Value**
Caregiver/Parent level Predictors Only:				
Initial Status				
Living Out of Home Situation	9.630	11.535	0.835	0.404
Caregiver/Parent- Not Biological Caregiver	-0.823	0.596	-1.383	0.167
Perception of the Neighborhood	0.237	0.047	5.103	0.000
Caregiver Age >55 years old	-1.164	1.603	-0.727	0.468
Master's Degree Level of Education	-0.238	2.303	-0.104	0.918
Caregiver Does Not Work	0.772	0.413	1.867	0.062
Number of Days Child Living Out of Home	0.002	0.000	3.585	0.000
Caregiver Level of Support Satisfaction	-2.247	0.353	-6.371	0.000
Growth				
Living Out of Home Situation	-2.538	5.618	-0.452	0.652
Caregiver/Parent- Not Biological Caregiver	0.722	0.299	2.417	0.016
Perception of the Neighborhood	-0.003	0.023	-0.135	0.893
Caregiver Age >55 years old	0.435	0.797	0.546	0.585
Master's Degree Level of Education	-1.059	1.211	-0.875	0.382
Caregiver Does Not Work	-0.116	0.205	-0.566	0.572
Number of Days Child Living Out of Home	0.000	0.000	-2.023	0.043
Caregiver Level of Support Satisfaction	0.515	0.176	2.916	0.004
Intercept				
I	60.385	1.414	42.707	0.000
S	-2.435	0.706	-3.449	0.001
Residual Variances				
I	92.394	4.339	21.294	0.000
S	9.354	1.524	6.136	0.000

Caregiver/parental level predictors for the intercept of growth trajectory include: perception of neighborhood, the number of days' child living out of home., and the caregivers level of support satisfaction. Caregiver/parental level predictors for the slope of growth trajectory include caregivers who are not the biological parents, caregivers who don't work, the number of days' child living out of home, and the caregiver level of support satisfaction. The average growth rate (slope) is -2.435, indicating that children tend to decrease in their externalizing

behavior by 2.435 units on average per interval. The variance of intercept and growth are 92.394 and 9.354, which suggests that both factors vary significantly among this group of children.

Table 12.28. Environmental Level Predictors versus Externalizing Behavior Trajectory Intermediate Model

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-Value**
Environmental Leve Predictors Only:				
Initial Status				
Juvenile Population in Corrections	0.000	0.000	-0.794	0.427
Total Number of Social Workers	0.000	0.000	-0.204	0.838
Total Social Assistance Establishment	0.000	0.001	-0.013	0.989
Proportion of White/Non-Hispanic Population	5.081	1.009	5.035	0.000
Growth				
Juvenile Population in Corrections	0.000	0.000	-0.051	0.959
Total Number of Social Workers	0.000	0.000	2.205	0.027
Total Social Assistance Establishment	-0.001	0.001	-1.665	0.096
Proportion of White/Non-Hispanic Population	-0.949	0.559	-1.698	0.090
Intercept				
I	53.689	0.812	66.117	0.000
S	-0.036	0.452	-0.080	0.936
Residual Variances				
I	83.084	4.258	19.511	0.000
S	12.265	1.447	8.476	0.000

Environmental level predictor for the intercept of growth trajectory includes the proportion of White/Non-Hispanic population. Environmental level predictor for the slope of growth trajectory includes the total number of Social Workers. The average growth rate (slope) is not significant. The variance of intercept and growth are 83.084 and 12.265, which suggests that both factors vary significantly among this group of children.

Table 12.29. Externalizing Behavior Trajectory Predictors Final Model

Externalizing Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-Value**
Initial Status				
Child Level:				
White/Non-Hispanic	0.588	0.585	1.006	0.315
Hispanic	-1.362	0.715	-1.905	0.057

Child Age	0.645	0.084	7.638	0.000
Low Social Skill	9.061	0.510	17.773	0.000
Sexual Abuse Type of Maltreatment	-0.432	0.720	-0.600	0.548
Physical Neglect Type of Maltreatment	-1.756	0.788	-2.227	0.026
Neglect Type of Maltreatment	-1.641	0.650	-2.527	0.012
Other Abuse Type of Maltreatment	-1.836	0.763	-2.407	0.016
Exposure to Mild/Severe Violence	0.284	0.060	4.712	0.000
One Risk Factor	1.306	0.588	2.220	0.026
Three Risk Factors	0.885	0.687	1.288	0.198
Four Risk Factors	-1.817	1.048	-1.734	0.083
Diagnosed with Cognitive Disability	-1.456	1.008	-1.444	0.149
Poor Physical Health	7.705	2.712	2.840	0.005
Caregiver/Parental Level:				
Living Out of Home Situation	-2.533	10.583	-0.239	0.811
Caregiver/Parent – Not Biological Caregiver	-0.525	0.724	-0.726	0.468
Perception of Neighborhood	0.188	0.056	3.384	0.001
Caregiver Age between 46-55 years old	1.363	0.967	1.409	0.159
Caregiver Age >55 years old	-2.003	1.702	-1.177	0.239
High School Degree Level of Education	-0.225	0.488	-0.461	0.645
Master's Degree Level of Education	-1.948	2.603	-0.748	0.454
Caregiver Does Not Work	1.229	0.501	2.453	0.014
Number of Days Child Living Out of Home	0.002	0.001	3.363	0.001
Caregiver Level of Support Satisfaction	-1.534	0.427	-3.591	0.000
Environmental Level:				
Number of Social Assistance Establishments	-0.001	0.000	-2.245	0.025
Proportion of White/Non-Hispanic Population	4.270	1.484	2.877	0.004
Growth				
Child Level:				
White/Non-Hispanic	-0.439	0.310	-1.418	0.156
Hispanic	-0.162	0.378	-0.429	0.668
Child Age	-0.137	0.051	-2.693	0.007
Low Social Skill	-1.910	0.269	-7.100	0.000
Sexual Abuse Type of Maltreatment	-0.205	0.385	-0.533	0.594
Physical Abuse Type of Maltreatment	-0.518	0.411	-1.260	0.208
Neglect Type of Maltreatment	0.223	0.343	0.652	0.514
Other Abuse Type of Maltreatment	0.247	0.406	0.608	0.543
Exposure to Mild/Severe Violence	-0.040	0.032	-1.266	0.205
One Risk Factor	-0.774	0.311	-2.489	0.013
Three Risk Factors	0.084	0.365	0.230	0.818
Four Risk Factors	0.557	0.555	1.004	0.315
Diagnosed with Cognitive Disability	0.992	0.535	1.853	0.064
Poor Physical Health	-0.220	1.419	-0.155	0.877
Caregiver/Parental Level:				
Living Out of Home Situation	-0.664	5.500	-0.121	0.904
Caregiver/Parent – Not Biological Caregiver	0.490	0.402	1.217	0.224

Perception of Neighborhood	0.006	0.031	0.189	0.850
Caregiver Age between 46-55 years old	-0.415	0.519	-0.799	0.424
Caregiver Age >55 years old	1.310	0.909	1.441	0.150
High School Degree Level of Education	0.220	0.258	0.856	0.392
Master's Degree Level of Education	-1.931	1.525	-1.266	0.205
Caregiver Does Not Work	-0.028	0.271	-0.104	0.917
Number of Days Child Living Out of Home	0.000	0.000	-1.677	0.094
Caregiver Level of Support Satisfaction	0.351	0.227	1.543	0.123
Environmental Level:				
Number of Social Assistance Establishments	0.000	0.000	0.623	0.533
Proportion of White/Non-Hispanic Population	-0.129	0.795	-0.162	0.871
Intercept				
I	47.160	2.384	19.781	0.000
S	0.329	1.304	0.252	0.801
Residual Variances				
I	70.187	4.491	15.629	0.000
S	7.766	2.249	3.453	0.001

Significant predictors for the intercept of growth trajectory include: child age, low social skill, physically neglected children, neglected, children abused by other types of maltreatment, exposed to mild/severe violence, have risk factors, poor physical health, caregiver's perception of the neighborhood, caregivers who don't work, children living out of home situation, the number of days' child living out of home, caregiver level of support satisfaction, the number social assistance establishments, and the proportion of White/Non-Hispanic population. Significant predictors for the slope of growth trajectory include: child age, low social skill, and children with risk factors. The average growth rate (slope) is not significant. The variance of intercept and growth are 70.187 and 7.766, which suggests that both factors vary significantly among this group of children.

Total Behavior Trajectory Predictors

Table 13.1. Gender versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Gender				

Initial Status				
Male	0.351	0.353	0.995	0.320
Growth				
Male	0.138	0.189	0.730	0.465
Intercept				
I	57.196	0.246	232.489	0.000
S	-1.083	0.133	-8.128	0.000
Residual Variances				
I	78.174	4.157	18.807	0.000
S	8.049	1.275	6.311	0.000

Being a male child is not a significant predictor for the intercept and slope of growth trajectory. But on average, the rate (slope) is -1.083, indicating that children tend to decrease in their problematic behavior by 1.083 units on average per interval. The variance of intercept and growth are 78.174 and 8.049, which suggests that both factors vary significantly among this group of children.

Table 13.2. Child Ethnicity versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Ethnicity				
Initial Status				
White/Non-Hispanic	1.476	0.411	3.592	0.000
Growth				
White/Non-Hispanic	0.037	0.218	0.171	0.865
Intercept				
I	56.804	0.318	178.868	0.000
S	-1.011	0.169	-5.985	0.000
Residual Variances				
I	77.387	4.153	18.633	0.000
S	8.035	1.274	6.307	0.000

A White/Non-Hispanic child is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. At the initial status, the effect of ethnicity on the problematic behavior trajectory is 1.476. The average growth rate (slope) is -1.011, indicating that children tend to decrease in their problematic behavior by 1.011 units on average per

interval. The variance of intercept and growth are 77.387 and 8.035, which suggests that both factors vary significantly among this group of children.

Table 13.3. Child Age versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Child Age				
Initial Status				
Child Age	0.619	0.042	14.628	0.000
Growth				
Child Age	-0.134	0.023	-5.858	0.000
Intercept				
I	53.026	0.360	147.298	0.000
S	0.201	0.195	1.031	0.303
Residual Variances				
I	72.322	4.501	16.068	0.000
S	7.238	1.283	5.642	0.000

The child's age is a significant predictor for the intercept and slope of growth trajectory. At the initial status, the effect of age on the problematic behavior trajectory is 0.619. The average growth rate (slope) is not significant. The variance of intercept and growth are 72.322 and 7.238, which suggests that both factors vary significantly among this group of children.

Table 13.4. Child Social Skills versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Social Skills				
Initial Status				
Low Social Skill	9.224	0.357	25.802	0.000
Growth				
Low Social Skill	-1.497	0.196	-7.637	0.000
Intercept				
I	54.544	0.203	268.400	0.000
S	-0.354	0.114	-3.097	0.002
Residual Variances				
I	63.174	3.661	17.254	0.000
S	7.905	1.258	6.285	0.000

A child with low social skill is a significant predictor for the intercept and slope of growth trajectory. At the initial status, the effect of social skill on the problematic behavior

trajectory is 9.224 at a rate of -1.497. The average problematic score initially is 54.544 for children with high social skills, and 45.320 (54.544 – 9.224) for children with low social skills. The average growth rate (slope) is -0.354, indicating that children tend to decrease in their problematic behavior by 0.354 unit on average per interval. The variance of intercept and growth are 63.174 and 7.905, which suggests that both factors vary significantly among this group of children.

Table 13.5. Types of Maltreatment versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Type of Maltreatment				
Initial Status				
Sexual Abuse	1.393	0.574	2.428	0.015
Physical Neglect	-1.614	0.532	-3.035	0.002
Neglect	-1.742	0.476	-3.659	0.000
Other Abuse	-1.623	0.559	-2.902	0.004
Growth				
Sexual Abuse	-0.372	0.309	-1.205	0.228
Physical Neglect	0.209	0.284	0.734	0.463
Neglect	0.463	0.254	1.819	0.069
Other Abuse	0.043	0.302	0.142	0.887
Intercept				
I	58.136	0.317	183.678	0.000
S	-1.094	0.171	-6.400	0.000
Residual Variances				
I	77.035	4.159	18.520	0.000
S	8.010	1.283	6.244	0.000

The types of maltreatment are significant predictors for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is -1.094, indicating that children tend to decrease in their problematic behavior by 1.094 units on average per interval. The variance of intercept and growth are 77.035 and 8.010, which suggests that both factors vary significantly among this group of children.

Table 13.6. Exposure to Violence versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				

Total Exposure to Violence				
Initial Status				
Mild/Severe Violence	0.287	0.089	3.238	0.001
Growth				
Mild/Severe Violence	0.028	0.047	0.593	0.553
Intercept				
I	57.100	0.405	140.839	0.000
S	-1.142	0.213	-5.354	0.000
Residual Variances				
I	78.354	5.433	14.422	0.000
S	6.202	1.685	3.681	0.000

Exposure to mild/severe violence is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. At the initial status, the effect of mild/severe violence exposure on the problematic behavior trajectory is 0.287. The average growth rate (slope) is -1.142, indicating that children tend to decrease in their problematic behavior by 1.142 units on average per interval. The variance of intercept and growth are 78.354 and 6.202, which suggests that both factors vary significantly among this group of children.

Table 13.7. Risk Factors versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Total Number of Risk Factors				
Initial Status				
One Risk	1.488	0.489	3.043	0.002
Three Risks	1.482	0.509	2.913	0.004
Growth				
One Risk	-0.628	0.259	-2.425	0.015
Three Risks	0.312	0.269	1.160	0.246
Intercept				
I	56.612	0.311	181.911	0.000
S	-0.963	0.167	-5.764	0.000
Residual Variances				
I	77.925	4.110	18.960	0.000
S	7.866	1.257	6.259	0.000

Having one and three risk factors are significant predictor for the intercept of growth trajectory, and having one risk factor is a significant predictor for the slope of growth. The average growth rate (slope) is -0.963, indicating that children tend to decrease in their

problematic behavior by 0.963 unit on average per interval. The variance of intercept and growth are 77.925 and 7.866, which suggests that both factors vary significantly among this group of children.

Table 13.8. Child Physical Health versus Total Behavior Trajectory

Total Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Child Physical Health				
Initial Status				
Very Good	3.103	0.412	7.526	0.000
Good	5.176	0.470	11.014	0.000
Fair	7.805	0.688	11.342	0.000
Poor	11.340	1.661	6.826	0.000
Growth				
Very Good	-0.462	0.221	-2.087	0.037
Good	-0.985	0.252	-3.912	0.000
Fair	-1.551	0.365	-4.246	0.000
Poor	-2.983	0.885	-3.371	0.001
Intercept				
I	54.768	0.265	206.603	0.000
S	-0.536	0.143	-3.748	0.000
Residual Variances				
I	74.133	3.872	19.145	0.000
S	8.485	1.262	6.722	0.000

Child physical health is a significant predictor for the intercept and slope of growth trajectory. The average growth rate (slope) is -0.536, indicating that children tend to decrease in their problematic behavior by 0.536 unit on average per interval. The variance of intercept and growth are 74.133 and 8.485, which suggests that both factors vary significantly among this group of children.

Table 13.9. Cognitive Disability versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Child Characteristics:				
Cognitive Disability				
Initial Status				
Yes	-0.251	0.578	-0.434	0.664
Growth				
Yes	1.423	0.306	4.644	0.000
Intercept				

I	57.411	0.186	308.389	0.000
S	-1.158	0.100	-11.552	0.000
Residual Variances				
I	78.218	4.122	18.976	0.000
S	7.894	1.262	6.258	0.000

Having a cognitive disability is a significant predictor for the slope of growth trajectory, but not for the intercept. The average growth rate (slope) is -1.158, indicating that children tend to decrease in their problematic behavior by 1.158 units on average per interval. The variance of intercept and growth are 78.218 and 7.894, which suggests that both factors vary significantly among this group of children.

Table 13.10. Caregiver/parent Age versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Age Bracket				
Initial Status				
46-55 years old	2.635	0.677	3.894	0.000
Growth				
46-55 years old	-0.176	0.361	-0.488	0.625
Intercept				
I	56.622	0.413	137.112	0.000
S	-0.776	0.219	-3.541	0.000
Residual Variances				
I	77.548	4.204	18.445	0.000
S	7.982	1.272	6.274	0.000

Caregivers who are 46-55 years old are significant predictors for the intercept of growth trajectory, but not for the slope of growth. The average rate (slope) is -0.776, indicating that children tend to decrease in their problematic behavior by 0.776 unit on average per interval. The variance of intercept and growth are 77.548 and 7.982, which suggests that both factors vary significantly among this group of children.

Table 13.11. Caregiver Educational Level versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Highest Educational Level				
Initial Status				

High School	-0.809	0.412	-1.962	0.050
Masters	4.657	1.263	3.686	0.000
Growth				
High School	-0.172	0.220	-0.780	0.435
Masters	-1.123	0.679	-1.654	0.098
Intercept				
I	57.731	0.341	169.171	0.000
S	-0.841	0.181	-4.650	0.000
Residual Variances				
I	77.515	4.141	18.721	0.000
S	8.041	1.275	6.309	0.000

Caregivers/parents who have obtained high school diploma and master's degree are significant predictors for the intercept of growth trajectory, but not for the slope of growth. The average rate (slope) is -0.841, indicating that children tend to decrease in their problematic behavior by 0.841 unit on average per interval. The variance of intercept and growth are 77.515 and 8.041, which suggests that both factors vary significantly among this group of children.

Table 13.12. Family Income versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Total Annual Family Income				
Initial Status				
$10,000-$19,999	-0.500	0.475	-1.053	0.292
Growth				
$10,000-$19,999	-0.105	0.251	-0.419	0.675
Intercept				
I	57.645	0.328	175.539	0.000
S	-0.919	0.175	-5.255	0.000
Residual Variances				
I	78.410	4.140	18.939	0.000
S	7.951	1.260	6.308	0.000

Family income is not a significant predictor for the intercept and slope of growth trajectory. But on average, the rate (slope) is -0.919, indicating that children tend to decrease in their problematic behavior by 0.919 unit on average per interval. The variance of intercept and growth are 78.410 and 7.951, which suggests that both factors vary significantly among this group of children.

Table 13.13. Marital Status versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Marital Status				
Initial Status				
Never Married	-1.274	0.447	-2.850	0.004
Growth				
Widowed	1.146	0.521	2.202	0.028
Intercept				
I	57.741	0.287	201.243	0.000
S	-1.089	0.155	-7.009	0.000
Residual Variances				
I	77.752	4.181	18.598	0.000
S	7.988	1.270	6.289	0.000

Never been married caregiver/parent is a significant predictor for the intercept of growth trajectory, but not for the intercept. However, a widowed caregiver is a significant predictor of growth. The average growth rate (slope) is -1.089, indicating that children tend to decrease in their problematic behavior by 1.089 units on average per interval. The variance of intercept and growth are 77.752 and 7.988, which suggests that both factors vary significantly among this group of children.

Table 13.14. Employment Status versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Employment Status				
Initial Status				
Does Not Work	1.075	0.379	2.836	0.005
Growth				
Does Not Work	-0.407	0.201	-2.023	0.043
Intercept				
I	56.971	0.261	218.026	0.000
S	-0.797	0.140	-5.697	0.000
Residual Variances				
I	77.958	4.114	18.951	0.000
S	8.012	1.263	6.344	0.000

Caregiver/parent who does not work is a significant predictor for intercept and slope of growth trajectory. The average growth rate (slope) is -0.797, indicating that children tend to

decrease in their problematic behavior by 0.797 unit on average per interval. The variance of intercept and growth are 77.958 and 8.012, which suggests that both factors vary significantly among this group of children.

Table 13.15. Number of Household Children versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Total Number of Children in the Household				
Initial Status				
Two Children	0.459	0.481	0.953	0.341
Growth				
Two Children	-0.329	0.257	-1.281	0.200
Intercept				
I	57.420	0.338	169.644	0.000
S	-0.924	0.182	-5.064	0.000
Residual Variances				
I	78.087	4.140	18.861	0.000
S	7.964	1.269	6.274	0.000

The number of children in the household is not a significant predictor for the intercept and slope of growth trajectory. But on average, the rate (slope) is -0.924, indicating that children tend to decrease in their problematic behavior by 0.924 unit on average per interval. The variance of intercept and growth are 78.087 and 7.964, which suggests that both factors vary significantly among this group of children.

Table 13.16. Living Situation versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Child Living Situation				
Initial Status				
Out-of-home Care	1.502	0.413	3.640	0.000
Growth				
Out-of-home Care	0.018	0.220	0.083	0.934
Intercept				
I	56.996	0.203	281.316	0.000
S	-1.032	0.108	-9.568	0.000
Residual Variances				
I	77.668	4.178	18.588	0.000
S	7.980	1.267	6.301	0.000

Living in out-of-home care is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. At the initial status, the effect of living out-of-home on the problematic behavior trajectory is 1.502. The average problematic score, in the beginning is 56.996 for children who stay at home, and 55.494 (56.996 - 1.502) for children living out-of-home. The average growth rate (slope) is -1.032, indicating that children tend to decrease in their problematic behavior by 1.032 units on average per interval. The variance of intercept and growth are 77.668 and 7.980, which suggests that both factors vary significantly among this group of children.

Table 13.17. Relationship to the Child versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Biological Parent of the Child				
Initial Status				
No	0.478	0.369	1.296	0.195
Growth				
No	0.334	0.195	1.715	0.086
Intercept				
I	57.193	0.220	259.505	0.000
S	-1.132	0.117	-9.689	0.000
Residual Variances				
I	78.693	4.150	18.962	0.000
S	7.890	1.248	6.322	0.000

Being the biological parent of the child is not a significant predictor for the intercept and slope of growth trajectory. But on average, the rate (slope) is -1.132, indicating that children tend to decrease in their problematic behavior by 1.132 units on average per interval. The variance of intercept and growth are 78.693 and 7.890, which suggests that both factors vary significantly among this group of children.

Table 13.18. Number of Days out of Home versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Cumulative Number of Days out of Home				
Initial Status				

Number of Days	0.001	0.000	4.575	0.000
Growth				
Number of Days	0.000	0.000	0.132	0.895
Intercept				
I	56.884	0.205	277.653	0.000
S	-1.047	0.110	-9.513	0.000
Residual Variances				
I	77.648	4.144	18.736	0.000
S	7.991	1.262	6.333	0.000

The total number of days out of home is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is -1.047, indicating that children tend to decrease in their problematic behavior by 1.047 units on average per interval. The variance of intercept and growth are 77.648 and 7.991, which suggests that both factors vary significantly among this group of children.

Table 13.19. Social Support Satisfaction versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Social Support Satisfaction Score				
Initial Status				
Social Support Satisfaction	-2.756	0.351	-7.848	0.000
Growth				
Social Support Satisfaction	0.601	0.175	3.439	0.001
Intercept				
I	66.261	1.204	55.028	0.000
S	-3.014	0.607	-4.962	0.000
Residual Variances				
I	83.122	4.412	18.840	0.000
S	6.963	1.157	6.016	0.000

Social support satisfaction score is a significant predictor for intercept and slope of growth trajectory. The average growth rate (slope) is -3.014, indicating that children tend to decrease in their problematic behavior by 3.014 units on average per interval. The variance of intercept and growth are 83.122 and 6.963, which suggests that both factors vary significantly among this group of children.

Table 13.20. Perception of Neighborhood versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Caregiver/Parental Characteristics:				
Perception of Neighborhood				
Initial Status				
Perception	0.291	0.041	7.039	0.000
Growth				
Perception	-0.037	0.022	-1.667	0.095
Intercept				
I	53.421	0.585	91.362	0.000
S	-0.515	0.315	-1.636	0.102
Residual Variances				
I	76.264	4.171	18.284	0.000
S	8.109	1.284	6.314	0.000

Caregiver/parent's perception of the neighborhood is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is not significant. The variance of intercept and growth are 76.264 and 8.109, which suggests that both factors vary significantly among this group of children.

Table 13.21. Percentage of Household Living <150% FDL versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Broader Environmental Characteristics:				
Percentage of Household living <150% FDL				
Initial Status				
Percentage	-2.733	2.712	-1.008	0.314
Growth				
Percentage	1.761	1.448	1.216	0.228
Intercept				
I	57.963	0.614	94.454	0.000
S	-1.395	0.328	-4.250	0.000
Residual Variances				
I	78.325	4.147	18.888	0.000
S	8.021	1.266	6.337	0.000

The percentage of household living in poverty is not a significant predictor for the intercept and slope of growth trajectory. But on average, the rate (slope) is -1.395, indicating that children tend to decrease in their problematic behavior by 1.395 units on average per

interval. The variance of intercept and growth are 78.325 and 8.021, which suggests that both factors vary significantly among this group of children.

Table 13.22. Population of Children in Juvenile Corrections versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Broader Environmental Characteristics:				
Population of Children in Juvenile Corrections				
Initial Status				
Population of Juvenile	-0.001	0.000	-5.136	0.000
Growth				
Population of Juvenile	0.000	0.000	0.830	0.406
Intercept				
I	57.749	0.190	303.459	0.000
S	-1.043	0.103	-10.176	0.000
Residual Variances				
I	77.323	4.148	18.641	0.000
S	8.026	1.274	6.302	0.000

Population of children in juvenile corrections is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is -1.043, indicating that children tend to decrease in their problematic behavior by 1.043 units on average per interval. The variance of intercept and growth are 77.323 and 8.026, which suggests that both factors vary significantly among this group of children.

Table 13.23. Number of Social Workers versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Broader Environmental Characteristics:				
Total Number of Social Workers				
Initial Status				
Number of Social Workers	0.000	0.000	-6.082	0.000
Growth				
Number of Social Workers	0.000	0.000	2.379	0.017
Intercept				
I	57.970	0.201	288.588	0.000
S	-1.132	0.108	-10.484	0.000
Residual Variances				
I	77.342	4.118	18.781	0.000
S	8.127	1.278	6.360	0.000

The total number of social workers is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is -1.132, indicating that children tend to decrease in their problematic behavior by 1.132 units on average per interval. The variance of intercept and growth are 77.342 and 8.127, which suggests that both factors vary significantly among this group of children.

Table 13.24. Social Assistance Establishments versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Broader Environmental Characteristics:				
Number of Social Assistance Establishment				
Initial Status				
Number of Establishment	-0.002	0.000	-6.359	0.000
Growth				
Number of Establishment	0.000	0.000	1.855	0.064
Intercept				
I	58.088	0.208	279.265	0.000
S	-1.117	0.112	-10.005	0.000
Residual Variances				
I	77.161	4.119	18.731	0.000
S	8.102	1.277	6.344	0.000

The number of social assistance establishments is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is -1.117, indicating that children tend to decrease in their problematic behavior by 1.117 units on average per interval. The variance of intercept and growth are 77.161 and 8.102, which suggests that both factors vary significantly among this group of children.

Table 13.25. Proportion of Ethnicity versus Total Behavior Trajectory

Total Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-value**
Broader Environmental Characteristics:				
Proportion Total Population				
Initial Status				
White (Non-Hispanic)	6.617	1.677	3.946	0.000
Growth				
White (Non-Hispanic)	0.812	0.924	0.879	0.379
Intercept				
I	52.883	1.598	33.098	0.000
S	-2.257	0.883	-2.556	0.011

Residual Variances				
I	76.204	4.124	18.477	0.000
S	8.170	1.290	6.331	0.000

The proportion of White/Non-Hispanic in the total population is a significant predictor for the intercept of growth trajectory, but not for the slope of growth. The average growth rate (slope) is -2.257, indicating that children tend to decrease in their problematic behavior by 2.257 units on average per interval. The variance of intercept and growth are 76.204 and 8.170, which suggests that both factors vary significantly among this group of children.

Table 13.26. Child Level Predictors versus Total Problematic Behavior Trajectory Intermediate Model

Total Problematic Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-Value**
Child Level Predictors Only:				
Initial Status				
White/Non-Hispanic	1.869	0.418	4.468	0.000
Child Age	0.585	0.070	8.340	0.000
Low Social Skill	9.359	0.430	21.774	0.000
Sexual Abuse Type of Maltreatment	1.182	0.561	2.106	0.035
Exposure to Mild/Severe Violence	0.338	0.050	6.739	0.000
Three Risk Factors	1.420	0.540	2.631	0.009
Diagnosed with Cognitive Disability	-0.569	0.847	-0.672	0.502
Poor Physical Health	10.954	2.319	4.724	0.000
Growth				
White/Non-Hispanic	-0.298	0.233	-1.277	0.201
Child Age	-0.140	0.040	-3.492	0.000
Low Social Skill	-1.881	0.238	-7.915	0.000
Sexual Abuse Type of Maltreatment	-0.417	0.315	-1.325	0.185
Exposure to Mild/Severe Violence	-0.024	0.028	-0.879	0.379
Three Risk Factors	0.398	0.304	1.308	0.191
Diagnosed with Cognitive Disability	1.598	0.476	3.357	0.001
Poor Physical Health	-2.603	1.294	-2.012	0.044
Intercept				
I	46.652	0.835	55.891	0.000
S	1.093	0.473	2.310	0.021
Residual Variances				
I	55.331	4.397	12.583	0.000
S	5.293	1.485	3.564	0.000

Child level significant predictors for the intercept of growth trajectory include: White/Non-Hispanic children, child age, local social skill children, exposed to mild/severe violence, sexually abused children, have three risk factors, and children with poor physical health. Child level significant predictors for the slope of growth trajectory include: child age, low social skill children, diagnosed with cognitive disability, and children with poor physical health. The average growth rate (slope) is 1.093, indicating that children tend to increase in their total problematic behavior by 1.093 units on average per interval. The variance of intercept and growth are 55.331 and 5.293, which suggests that both factors vary significantly among this group of children.

Table 13.27. Caregiver/Parental Level Predictors versus Total Problematic Behavior Trajectory Intermediate Model

Total Problematic Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-Value**
Caregiver/Parent Level Predictors Only:				
Initial Status				
Living Out of Home Situation	6.631	11.393	0.582	0.561
Caregiver/Parent- Not Biological Caregiver	-1.162	0.593	-1.960	0.050
Perception of the Neighborhood	0.267	0.047	5.739	0.000
Caregiver Age >55 years old	-0.963	1.589	-0.606	0.545
Master's Degree Level of Education	0.367	2.280	0.161	0.872
Caregiver Does Not Work	1.322	0.410	3.221	0.001
Number of Days Child Living Out of Home	0.002	0.000	3.630	0.000
Caregiver Level of Support Satisfaction	-2.537	0.350	7.251	0.000
Never Been Married	-2.006	0.442	-4.542	0.000
Growth				
Living Out of Home Situation	-3.152	5.770	-0.546	0.585
Caregiver/Parent- Not Biological Caregiver	0.543	0.299	1.817	0.069
Perception of the Neighborhood	-0.004	0.023	-0.186	0.852
Caregiver Age >55 years old	0.461	0.799	0.577	0.564
Master's Degree Level of Education	-1.338	1.212	-1.104	0.270
Caregiver Does Not Work	-0.152	0.204	-0.744	0.457
Number of Days Child Living Out of Home	0.000	0.000	-1.047	0.295
Caregiver Level of Support Satisfaction	0.577	0.176	3.271	0.001
Never Been Married	0.182	0.220	0.828	0.408
Intercept				
I	61.788	1.402	44.066	0.000

S	-2.916	0.706	-4.131	0.000
Residual Variances				
I	80.249	4.414	18.180	0.000
S	7.136	1.177	6.065	0.000

Caregiver/parental level predictors for the intercept of growth trajectory include: caregivers who are not the biological parents, perception of neighborhood, caregivers who don't work, the number of days' child living out of home., the caregivers level of support satisfaction, and caregivers who are not married. Caregiver/parental level predictor for the slope of growth trajectory includes caregiver level of support satisfaction. The average growth rate (slope) is -2.916, indicating that children tend to decrease in their total problematic behavior by 2.916 units on average per interval. The variance of intercept and growth are 80.249 and 7.136, which suggests that both factors vary significantly among this group of children.

Table 13.28. Environmental Level Predictors versus Total Problematic Behavior Trajectory Intermediate Model

Total Problematic Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-Value**
Environmental Leve Predictors Only:				
Initial Status				
Juvenile Population in Corrections	0.000	0.000	-0.065	0.949
Total Number of Social Workers	0.000	0.000	-0.117	0.907
Proportion of White/Non-Hispanic Population	5.275	1.033	5.104	0.000
Total Social Assistance Establishment	-0.001	0.001	-0.410	0.681
Growth				
Juvenile Population in Corrections	0.000	0.000	-0.652	0.515
Total Number of Social Workers	0.000	0.000	1.911	0.056
Proportion of White/Non-Hispanic Population	-0.855	0.565	-1.513	0.130
Total Social Assistance Establishment	-0.001	0.001	-1.048	0.294
Intercept				
I	54.086	0.832	65.009	0.000
S	-0.447	0.454	-0.984	0.325
Residual Variances				
I	76.223	4.130	18.458	0.000
S	8.224	1.291	6.368	0.000

Environmental level predictor for the intercept of growth trajectory includes the proportion of White/Non-Hispanic population. There are no significant environmental level predictors for the slope of growth trajectory. The average growth rate (slope) is not significant. The variance of intercept and growth are 76.223 and 8.224, which suggests that both factors vary significantly among this group of children.

Table 13.29. Total Problematic Behavior Trajectory Predictors Final Model

Total Problematic Behavior Trajectory Predictors	**Estimate**	**SE**	**Est./SE***	**p-Value**
Initial Status				
Child Level:				
White/Non-Hispanic	0.569	0.585	0.973	0.331
Hispanic	-0.846	0.712	-1.187	0.235
Child Age	0.572	0.083	6.903	0.000
Low Social Skill	9.228	0.501	18.414	0.000
Sexual Abuse Type of Maltreatment	0.613	0.647	0.947	0.343
Exposure to Mild/Severe Violence	0.314	0.060	5.221	0.000
One Risk Factor	1.256	0.578	2.172	0.030
Three Risk Factors	1.339	0.667	2.006	0.045
Diagnosed with Cognitive Disability	-0.567	1.007	-0.563	0.573
Poor Physical Health	11.048	2.713	4.073	0.000
Caregiver/Parental Level:				
Living Out of Home Situation	-4.188	10.626	-0.394	0.693
Caregiver/Parent – Not Biological Caregiver	-0.592	0.723	-0.819	0.413
Perception of Neighborhood	0.168	0.055	3.057	0.002
Caregiver Age between 46-55 years old	1.252	0.966	1.296	0.195
Caregiver Age >55 years old	-2.137	1.697	-1.259	0.208
Master's Degree Level of Education	-0.993	2.598	-0.382	0.702
Caregiver Does Not Work	1.677	0.497	3.375	0.001
Number of Days Child Living Out of Home	0.002	0.001	3.019	0.003
Caregiver Level of Support Satisfaction	-1.803	0.426	-4.231	0.000
Environmental Level:				
Number of Social Assistance Establishments	-0.001	0.000	-2.592	0.010
Proportion of White/Non-Hispanic Population	4.322	1.480	2.920	0.003
Growth				
Child Level:				
White/Non-Hispanic	-0.220	0.302	-0.729	0.466
Hispanic	-0.034	0.364	-0.093	0.926
Child Age	-0.174	0.046	-3.811	0.000
Low Social Skill	-1.523	0.255	-5.978	0.000
Sexual Abuse Type of Maltreatment	-0.310	0.334	-0.927	0.354

Exposure to Mild/Severe Violence	-0.034	0.031	-1.127	0.260
One Risk Factor	-0.848	0.301	-2.813	0.005
Three Risk Factors	-0.106	0.339	-0.313	0.755
Diagnosed with Cognitive Disability	1.144	0.523	2.185	0.029
Poor Physical Health	-1.169	1.411	-0.828	0.407
Caregiver/Parental Level:				
Living Out of Home Situation	-1.724	5.677	-0.304	0.761
Caregiver/Parent – Not Biological Caregiver	0.277	0.383	0.723	0.469
Perception of Neighborhood	0.024	0.028	0.827	0.408
Caregiver Age between 46-55 years old	0.019	0.500	0.037	0.970
Caregiver Age >55 years old	1.986	0.886	2.241	0.025
Master's Degree Level of Education	-2.081	1.485	-1.401	0.161
Caregiver Does Not Work	-0.170	0.257	-0.664	0.506
Number of Days Child Living Out of Home	0.000	0.000	-1.233	0.217
Caregiver Level of Support Satisfaction	0.405	0.221	1.838	0.066
Environmental Level:				
Number of Social Assistance Establishments	0.000	0.000	1.162	0.245
Proportion of White/Non-Hispanic Population	-0.337	0.770	-0.438	0.661
Intercept				
I	47.593	2.309	20.616	0.000
S	-0.038	1.201	-0.032	0.974
Residual Variances				
I	58.529	4.932	11.867	0.000
S	4.091	1.293	3.164	0.002

Significant predictors for the intercept of growth trajectory include: child age, low social skill, exposed to mild/severe violence, have risk factors, poor physical health, caregiver's perception of the neighborhood, caregivers who don't work, the number of days' child living out of home, caregiver level of support satisfaction, the number social assistance establishments, and the proportion of White/Non-Hispanic population. Significant predictors for the slope of growth trajectory include: child age, low social skill, children with risk factors, children with cognitive disability, and caregivers who are over 55 years old. The average growth rate (slope) is not significant. The variance of intercept and growth are 58.529 and 4.091, which suggests that both factors vary significantly among this group of children.

Overall, there were several child, caregiver/parental, and environmental effects that were found to be statistically significant predictors of the intercept and slope of growth trajectory for the three behavioral paths. Table 14 is a summary table of the significant predictors as it relates to internalizing, externalizing, and total behavior problems. As the table below demonstrates, there are both similarities and differences in predictors of internalizing, externalizing, and total behavioral problem trajectories. These similarities and differences will be discussed in more detail in the next chapter.

Table 14. Summary Table of Significant Predictors of Child Behavior Paths

Internalizing Behavior Trajectory	**Externalizing Behavior Trajectory**	**Total Problematic Behavior Trajectory**
Child-Level Predictors		
Initial Status • Male • Hispanic • Age • Low social skill • Neglect • Mild/Severe Violence • Physical health Growth • Male • Child Age • Low social skill • Cognitive disability	Initial Status • Age • Low social skill • Physical neglect • Neglect • Other abuse • Mild/Severe violence • Risk Factors • Physical Health Growth • Age • Low social skill • Risk Factor	Initial Status • Age • Low social skill • Mild/Severe Violence • Risk Factors • Physical Health Growth • Age • Low social skill • Risk Factors • Cognitive Disability
Caregiver/Parent-Level Predictors		
Initial Status • Perception of Neighborhood • Does not work • Number of days out • Social Support Growth • Caregiver age >55 years old	Initial Status • Perception of neighborhood • Does not work • Number of days out • Social support Growth	Initial Status • Perception of Neighborhood • Does not work • Number of days out • Social Support Growth • Caregiver age >55 years old
Environmental-Level Predictors		
Initial Status	Initial Status	Initial Status

• Number of Social Assist. Establishment • White (Non-Hispanic) Proportion Growth	• Number of Social Assist. Establishment • White (Non-Hispanic) Proportion Growth	• Number of Social Assist. Establishment • White (Non-Hispanic) Proportion Growth

The next and final chapter will discuss how these results answer the aims of this dissertation as well as discuss how these findings related to what has been previously established in the literature. Additionally, the final chapter will discuss relevance of these findings as it relates to social work practice and policy implications. Lastly, it will close with a discussion of strengths and limitations of this study and offer recommendations for future research.

Chapter V: Discussion

This final chapter will discuss the findings reported in the previous chapter. Additionally, a discussion of both the practice and policy implications will also be included. This chapter will conclude with a discussion of the strengths, limitations, and recommendations for future research. The analyses and results presented in the previous chapter sought to address three (3) aims: (1) Identify the number, shape, and size of subgroups of children following distinct behavioral trajectories, (2) Describe the characteristics of children for each problematic behavior trajectory groups, and (3) Explore the predictors (child, parent/caregiver, and environmental) for the intercept and slope of growth trajectory of the three behavioral problem groups. This chapter will seek to explain how the accompanying aims and hypotheses were answered based on the analyses conducted in this dissertation.

Aim One

The goal is to identify the number, shape, and size of subgroups of children following distinct behavioral trajectories. The hypothesis was that maltreated children follow distinct behavioral paths. Based on the results presented in the previous chapter, the hypothesis was partially supported. GMM analyses revealed that children follow distinct trajectory, unfortunately, the model fit indices indicated that proposed models did not fit the data very well.

Aim Two

The goal is to describe the characteristics of children in distinct behavior trajectory. Based on the GMM analyses, children were not successfully separated into different independent groups. Therefore, the hypothesis on children in different distinct trajectory groups differs in their characteristics was not supported. The descriptive information of the sample was then generated because there is only one group.

Aim Three

Goal number three (3) was to determine if differences and changes in certain child factors, caregiver factors, and environmental factors will have a differential effect on the internalizing, externalizing, and total problematic behavior trajectories. To answer this question, first remember the Ecological Systems Theory that guided this study. Each of the significant predictors will now be discussed as it relates to the literature presented in chapter 2. Internalizing behavior trajectory predictors are discussed first, then externalizing behavior trajectory predictors, and lastly, the predictors for total problematic trajectory will be explained.

Internalizing Behavior Trajectory Predictors

Child-level predictors. Significant child-level predictors included child sex, child race/ethnicity, child age, social skills, type of maltreatment, exposure to violence, and physical health. Male children are more likely to exhibit internalizing behavior than their female counterpart. This is a surprise because females typically exhibit more internalizing behavior than males (Achenbach, 1991). The result may help social workers to focus on male children in addressing this problematic behavior. Hispanic children are more likely to exhibit internalizing behavior than their Black/non-Hispanic counterparts. This is an opportunity for practitioners to focus more on Hispanic children in terms finding interventions to lessen the problematic behavior. Older children in this current study are more like to exhibit internalizing behavior which is consistent to the research conducted Rosenthal & Curiel (2006), that older children were reported as exhibiting internalizing behavioral problems. Children with low social skills are more likely to exhibit internalizing behavior than children with high social skills. Also, children with low social skills have a slower rate of decrease in their problematic behavior. Child social skills previously proven to be one of the most significant predictors of child behavior problems

(Murphy, 2012). Children who were neglected are less likely to exhibit internalizing behavior than children who were physically maltreated. Neglected child is a significant predictor of the internalizing behavior among maltreated children in the current study, which is consistent with some of the existing literature (Flaherty et al., 2009; Litrownik et al., 2005). Maltreated children in this current study who were exposed to mild or severe violence are likely to exhibit internalizing behavior than those who were not exposed to violence, which is consistent with an existing literature (Flaherty et al., 2009). The result of the current study is consistent with the study conducted by English and colleagues (2002). Children who were exposed to violence exhibited higher levels of problematic behavior (English et al., 2009). Children with poor physical health are most likely to exhibit problematic behavior than children with excellent and very good health. However, children with cognitive disability have a faster rate of increase in their internalizing behavior problems. This may be due to the caregivers rating the child's behavior more favorably due to the cognitive impairment. They may have, perhaps, viewed the behaviors as "normal" and discounted the fact that they were still behavior problems. It could also be due to the children having less ability to process events that occurred in their environment or do not have the cognitive capacity to understand or perceive negative events as such, which results in them reacting differently than children with no cognitive disability.

Caregiver-level predictors. Significant caregiver-level predictors include the perception of the neighborhood, caregivers who don't work, caregiver's report on the number of days a child living at home, and the caregiver's level of support satisfaction. Abused children of caregivers who were over 55 years old are more likely to exhibit internalizing behavior than children of younger caregivers. The result is inconsistent with some existing literature (Kalil & Dunifon, 2007; Murphy, 2012) that suggested that younger caregivers report a higher level of

child behavior problems. Children of caregivers who don't work are likely to exhibit internalizing behavior than children of caregivers who work full-time. Children who are living out-of-home are more likely to exhibit internalizing behavior than children who stay in their original home. This is probably because children are not comfortable staying at another people's house temporarily. Also, the longer they stay out-of-home, the higher their internalizing behavior compared to their counterpart. This is very important predictor because when the child is removed from their house, they must be placed somewhere safe. However, it also impacts their behavior. Children of caregivers with high social support satisfaction are less likely to exhibit internalizing behavior. Also, children will also have a faster rate of decrease in their problematic behavior. Social support is one of the most important factors for distinguishing between children who were "doing well" from those who were "not doing well." This study confirms this claim, as caregivers who reported lower levels of social support also reported higher levels of behavior problems for the children in their care. The results presented in Chapter 4 also suggest that caregivers with a more negative perception of their neighborhood reported higher levels of behavior problems for the children in their care. This is consistent with the literature that states that caregivers who had a negative perception of their neighborhood reported a higher level of depression and violence (Cooley, Wojciak, Farineau, & Mullis, 2014; Johnson et al., 2002).

Environmental-level predictors. Significant environmental level predictors included the number of social assistance establishment, and the proportion of White/Non-Hispanic in the area or a primary sampling unit (PSU). PSUs with more access to social services per capita had significantly lower levels of problematic child behavior. This is consistent with current research that indicated that lack of access or perceived barriers to services resulted in more behavior problems (Morrison Gutman et al., 2005). Access to social services per capita in a PSU was

defined in this study as the number of civic organizations and number of social assistance establishments located in a PSU. PSUs with a higher percentage of White (Non-Hispanic) had higher levels of behavior problems. This finding was also inconsistent with the literature that states that areas with a higher percentage of minorities reside in poverty-stricken areas (Quillian, 2003), which have been shown to result in higher levels of behavior problems (Hoffman et al., 2006). Therefore, this result may be because families were residing in more affluent neighborhoods have less violent crime and delinquent behavior. Therefore, if a child exhibits slightly negative behavior, this may be exacerbated by the caregiver if they are comparing the child with other children in the neighborhood.

Externalizing Behavior Trajectory Predictors

Child-level predictors. Significant child-level predictors included child age, social skills, type of maltreatment, exposure to violence, risk factors, and physical health. Older children in this current study are more like to exhibit externalizing behavior which is consistent to the research conducted Rosenthal & Curiel (2006), that older children were reported as exhibiting externalizing behavioral problems. Children with low social skills are more likely to exhibit externalizing behavior than children with high social skills. Also, children with low social skills have a slower rate of decrease in their problematic behavior. Child social skills previously proven to be one of the most significant predictors of child behavior problems (Murphy, 2012). Children who were neglected are less likely to exhibit externalizing behavior than children who were physically maltreated. Neglected child is a significant predictor of the externalizing behavior among maltreated children in the current study, which is consistent with some of the existing literature (Flaherty et al., 2009; Litrownik et al., 2005). Maltreated children in this study who were physically neglected, neglected, and experienced other type of abuse are less likely to

exhibit externalizing behavior than children who were physically maltreated. This is consistent with some literature (Litrownik et al., 2005). Litrownik and colleagues (2005) reported that children who experience neglect exhibited fewer externalizing behavior problems. Children who were exposed to mild or severe violence are likely to exhibit externalizing behavior than those who were not exposed to violence. The result is consistent with the study conducted by English and colleagues (2002). Children who were exposed to violence exhibited higher levels of problematic behavior (English et al., 2009). Children with one and three risk factors are likely to exhibit externalizing behavior than children with zero risk factors. The result is inconsistent with the findings that Murphy (2012) reported that risk factors didn't contribute to the behavioral problem of the child. Children with poor physical health are most likely to exhibit problematic behavior than children with excellent and very good health.

Caregiver-level predictors. Significant caregiver-level predictors include the perception of the neighborhood, caregivers who don't work, caregiver's report on the number of days a child living at home, and the caregiver's level of support satisfaction. Children who are staying longer in an out-of-home are more likely to exhibit externalizing behavior than children who remain in their original home. This is probably because children are not comfortable staying at another people's house temporarily. Also, the longer they stay out-of-home, the higher their externalizing behavior compared to their counterpart. This is very important predictor because when the child is removed from their house, they must be placed somewhere safe. However, it also impacts their behavior. Children of caregivers with high social support satisfaction are less likely to exhibit externalizing behavior. Social support is one of the most important factors for distinguishing between children who were "doing well" from those who were "not doing well." This study confirms this claim, as caregivers who reported lower levels of social support also

reported higher levels of behavior problems for the children in their care. The results presented in Chapter 4 also suggest that caregivers with a more negative perception of their neighborhood reported higher levels of behavior problems for the children in their care. This is consistent with the literature that states that caregivers who had a negative perception of their neighborhood reported a higher level of depression and violence (Murphy, 2012).

Environmental-level predictors. Significant environmental level predictors included the number of social assistance establishment, and the proportion of White/Non-Hispanic in the area or a primary sampling unit (PSU). PSUs with more access to social services per capita had significantly lower levels of problematic child behavior. This is consistent with current research that indicated that lack of access or perceived barriers to services resulted in more behavior problems (Morrison Gutman et al., 2005). Access to social services per capita in a PSU was defined in this study as the number of civic organizations and number of social assistance establishments located in a PSU. PSUs with a higher percentage of White (Non-Hispanic) had higher levels of behavior problems. This finding was also inconsistent with the literature that states that areas with a higher percentage of minorities reside in poverty-stricken areas (Quillian, 2003), which have been shown to result in higher levels of behavior problems (Hoffman et al., 2006). Therefore, this result may be because families were residing in more affluent neighborhoods have less violent crime and delinquent behavior. Therefore, if a child exhibits slightly negative behavior, this may be exacerbated by the caregiver if they are comparing the child with other children in the neighborhood.

Total Behavior Trajectory

Child-level predictors. Significant child-level predictors included child age, social skills, exposure to violence, risk factors, physical health, and cognitive disability. Older children in this

current study are more like to exhibit problematic behavior which is consistent to an existing literature that older children were reported as exhibiting externalizing behavioral problems (Rosenthal & Curiel, 2006). Also, older children have a faster rate of decrease in their problematic behavior. Children with low social skills are likely to exhibit problematic behavior than children with high social skills. Also, children with low social skills have a slower rate of decrease in their problematic behavior. Child social skills proved to be one of the most important predictors of child behavior problems (Murphy, 2012). Children who were exposed to mild/severe violence are more likely to exhibit problematic behavior than those who were not exposed to violence. Also, children who were exposed to mild/severe violence will have a slower rate of decrease in their problematic behavior. The result is consistent with the study conducted by English and colleagues (2002). Children who were exposed to violence exhibited higher levels of problematic behavior (English et al., 2009). Children with one and three risk factors are likely to exhibit problematic behavior than children with zero risk factors. The result is inconsistent with the findings that Murphy (2012) reported that risk factors didn't contribute to the behavioral problem of the child. Children with poor physical health are most likely to exhibit problematic behavior than children with excellent and very good health. Also, children with cognitive disability have a faster rate of increase in their problematic behavior. This may be due to the caregivers rating the child's behavior due to the cognitive impairment. They may have, perhaps, viewed the behaviors as problematic. It could also be due to the fact children having less ability to process events that occurred in their environment or do not have the cognitive capacity to understand or perceive negative events as such, which results in them reacting differently than children with no cognitive disability.

Caregiver-level predictors. Significant caregiver-level predictors in the final model include the age of the caregivers, caregivers who don't work, perception of the neighborhood, caregiver's report on the number of days a child living at home, and the caregiver's level of support satisfaction. Children of older caregivers reported to have faster rate of increase in problematic behavior. Children of caregivers who don't work are more likely to exhibit problematic behavior than children of jobless caregivers. Children who are staying longer in an out-of-home are more likely to exhibit problematic behavior than children who remain out—of-home. This is probably because children are not comfortable staying at another people's house temporarily. This is very important predictor because when the child is removed from their house, they must be placed somewhere safe. However, it also impacts their behavior. Children of caregivers with high social support satisfaction are less likely to exhibit problematic behavior. Social support is one of the most important factors for distinguishing between children who were "doing well" from those who were "not doing well." This study confirms this claim, as caregivers who reported lower levels of social support also reported higher levels of behavior problems for the children in their care. The results presented in Chapter 4 also suggest that caregivers with a more negative perception of their neighborhood reported higher levels of behavior problems for the children in their care. This is consistent with the literature that states that caregivers who had a negative perception of their neighborhood reported a higher level of depression and violence (Murphy, 2012).

Environmental-level predictors. Significant environmental level predictors included the number of social assistance establishment, and the proportion of White/non-Hispanic in the area or a primary sampling unit (PSU). PSUs with more access to social services per capita had significantly lower levels of problematic child behavior. This is consistent with current research

that indicated that lack of access or perceived barriers to services resulted in more behavior problems (Morrison Gutman et al., 2005). Access to social services per capita in a PSU was defined in this study as the number of civic organizations and number of social assistance establishments located in a PSU. PSUs with a higher percentage of White (Non-Hispanic) had higher levels of behavior problems. This finding was also inconsistent with the literature that states that areas with a higher percentage of minorities reside in poverty-stricken areas (Quillian, 2003), which have been shown to result in higher levels of behavior problems (Hoffman et al., 2006). Therefore, this result may be because families were residing in more affluent neighborhoods have less violent crime and delinquent behavior. Therefore, if a child exhibits slightly negative behavior, this may be exacerbated by the caregiver if they are comparing the child with other children in the neighborhood. The number of social workers is a new significant predictor introduced in this study. The need for social workers in the area will help maltreated children and their families lower the problematic behavior score.

Study Strengths and Limitations

This dissertation has many strengths and reasons why this study is important. First, the data that will be utilized in this analysis are panel data on over 5,000 maltreated children. Researchers followed these children over a period of six (6) years, which allowed for longitudinal analysis that allows researchers to measure change over time. This reduces the threat to internal validity and will be discussed later in the proposal.

Second, the type of analysis will be utilized in this study will allow for examination of multi-level predictors of child behavioral outcomes on multiple levels. This allows practitioners, researchers, and policy makers to more accurately and precisely target individual, family, and community-level interventions. It is important to remember that multilevel analysis can account

for variations at multiple levels within the child's social context, illuminating the importance of environmental factors on many social problems, including child maltreatment.

Lastly, the sample that is included is from the National Survey of Child and Adolescent Well-Being (NSCAW), which is a nationally representative data set. This increases the generalizability of the results. The results from this study will enable practitioners, researchers, and policy makers to address the need to identify multiple-level factors affecting child behavioral problems. Also, NSCAW researchers took several steps to ensure that the sample was representative and measurement errors, which are inevitably present in standardized instruments, were minimized.

There are several limitations to the analysis method that must be considered. These limitations are related to measurement error and history. Measurement error takes on two forms: systematic error and random error. Systematic error is inevitably present when using standardized instruments (Meyers, 2006).However, the NSCAW research team was developed to ensure that the best instruments were used based on psychometric properties and applicability to the age of participants (Dowd et al., 2008). Additionally, sensitive information solicited from participants was administered on a computer to reduce embarrassment of participants and increase accuracy of responses. Random error, on the other hand, is the result of participant mood or attitude, which may vary on any given day (Meyers, 2006). However, since the data that will be analyzed is panel data collected over a period of approximately six (6) years, random error is less problematic. This is due to the fact that panel studies examine the same individuals over time, thus are deemed more powerful and accurate than either trend or cohort studies (Rubin, 2008). Another common threat to internal validity is history. These threats are related to other factors that occur outside of the study that may influence participant responses on given

instruments (Rubin, 2008). For example, in the panel data that I plan to analyze, one of the outcome measures is Internalizing Behavior Problems. This is partly comprised of anxiety and depression subscales of the Child Behavior Checklist (CBCL). Thus, if a child suddenly experiences a death in the family, this may result in increased levels of Internalizing Behavior Problems. However, there is no way to differentiate the infinite number of potential factors that may contribute to differences of scores on the instruments.

Few variables are not properly categorized (i.e. Asians and other ethnicity are lumped together, maltreatment type category has two different types of neglect, and PSU variables don't converge in the analysis). The result was unsuccessful in delineating distinct trajectory group which forced to draw a conclusion using only one group. Parenting styles are not included in the NSCAW data which makes it difficult to determine whether problematic behaviors are related to the parenting styles. The types of social services are not delineated which is again difficult to determine whether abused children receive appropriate social services needed. Data analysis has been challenging in this study because it required extra resources to analyze the results.

Practice Implications

Recognizing the existence of differing developmental paths for children who come to the attention of child welfare services, child welfare professionals may begin to provide children and parents most at risk for persistent problematic behaviors with appropriate services. Encouragingly, most children in this high-risk population follow an approximately normative decline in problematic behaviors. A sizable group of children still exhibits persistent or worsening problematic behaviors. Early identification of these children could improve planning and delivery of effective mental health and behavioral interventions that have the potential to change behavioral trajectories, reduce problematic behaviors over time and ultimately improve

child well-being. Improvements in the behavior of child welfare-involved children—specifically those in foster care—have been seen for those engaged in systematic parenting and behavior focused treatment, whereas children without such treatment have shown worsening behavior (Fisher, Gunnar, Chamberlain, & Reid, 2000) and lower rates of permanency (Fisher, Kim, & Pears, 2009). Similar approaches should be implemented with children remaining in their homes after an investigation by child welfare services.

The most glaring practice implication that can be taken from the results presented here is that all children are different and respond differently to the circumstances that they face. Table 14 at the end of chapter 4 clearly shows that there are different predictors for different behavior problems. For example, being a male child was predictive of internalizing problems, but not for externalizing and total behavioral problems. Therefore, interventions must be targeted appropriately to effectively and efficiently reduce child behavior problems.

On a child level, the results indicate that social skills are one of the most important predictors of child behavior problems. Children with scores in the lowest 10% (social skills =70) were predicted to have problematic behavior trajectory in the "borderline clinical" range, closely approaching a clinical level. Additionally, the predicted internalizing behavior problems for children with scores in the lowest 10% (social skills = 70) were approaching the "borderline clinical" level. Therefore, these results suggest that social skills training may be an important factor to consider when developing intervention plans for children presenting with behavior problems. Social skills training can be integrated into the treatment plan in the form of modeling and feedback.

A second major finding on the child-level predictors was the impact of exposure to

violence on child behavior problems. Children who scored in the 90th percentile (exposure to violence score =11) had scores approaching the "borderline clinical" range. This suggests that not only experiencing maltreatment as normally defined (e.g., physical, sexual, neglect) but simply being exposed to violence in his or her environment results in higher behavior problems. Therefore, this study showed that being exposed to violence (e.g., domestic violence) results in maladaptive child behavior which points to the damage of living in a violent home. Given a large number of predictors included in the model analyzed in this study, it is important to note that exposure to violence ended up being one of the most important predictors of child behavior problems. This suggests that focus on the family and interventions aimed at reducing family violence may prove to be an important intervention strategy to reduce child behavior problems.

The results also indicated that caregivers must be involved in any treatment modality, as evidenced by the number of caregiver-level predictors that proved to be statistically significant predictors of child behavior problems. However, it is important to note that the caregiver was the current caregiver and not necessarily the biological caregiver, which may impact these implications. With that being noted, caregivers who reported higher levels of neighborhood perception and lower levels of social support also reported a higher level of behavior problems across the board for the children in their care. Therefore, interventions aimed at assisting caregivers with safety net resources in the community, whether in the form of education or physical/local resources, as well as improving social support may be an important consideration when looking to reduce child behavior problems.

Policy Implications

There are several policy implications related to the findings presented in this dissertation. The results indicated that having children placed longer in an out-of-home setting increased the

problematic behaviors. Children who were placed longer in an out-of-home setting are more likely to exhibit behavior problems across the board when compared to children who remained in that same environment for a lesser amount of time. These results seem to support legislation aimed at reducing the amount of time a child remains in out- of-home care without finding a permanent placement, such as the *Fostering Connections* initiative. The *Fostering Connections Act of 2008* focused on finding relatives or other close connections that may increase the likelihood of permanency. The results presented here suggest that placement stability and permanency may help reduce child behavior problems.

The second major policy implication that will be presented focuses on President Obama's *Strengthening Communities* initiative discussed in chapter 1. This initiative ultimately aims to improve communities and reduce maltreatment and its consequences through five (5) mechanisms: (a) nurturing and attachment, (b) knowledge of parenting and of child and youth development, (c) parental resilience, (d) social connections, and *(e)* concrete supports for parents. There were two (2) caregiver-level predictors that speak to these mechanisms. Social support, as perceived by the caregiver, decreased child behavior problems. Therefore, building up communities to facilitate community attachment and responsiveness may improve perceived social support thereby reducing child behavior problems. Caregiver perception of the neighborhood was also a predictor of child behavior. Caregivers with a more favorable perception of their neighborhood also rated the children in their care as having lower behavior problems. This suggests that by reducing perceived crime and gang activity and improving perceived safety in a neighborhood may lead to reduced behavior problems for children residing in those areas. These findings support President Obama's initiative and should be examined more diligently.

Relevance to Social Work and Social Welfare

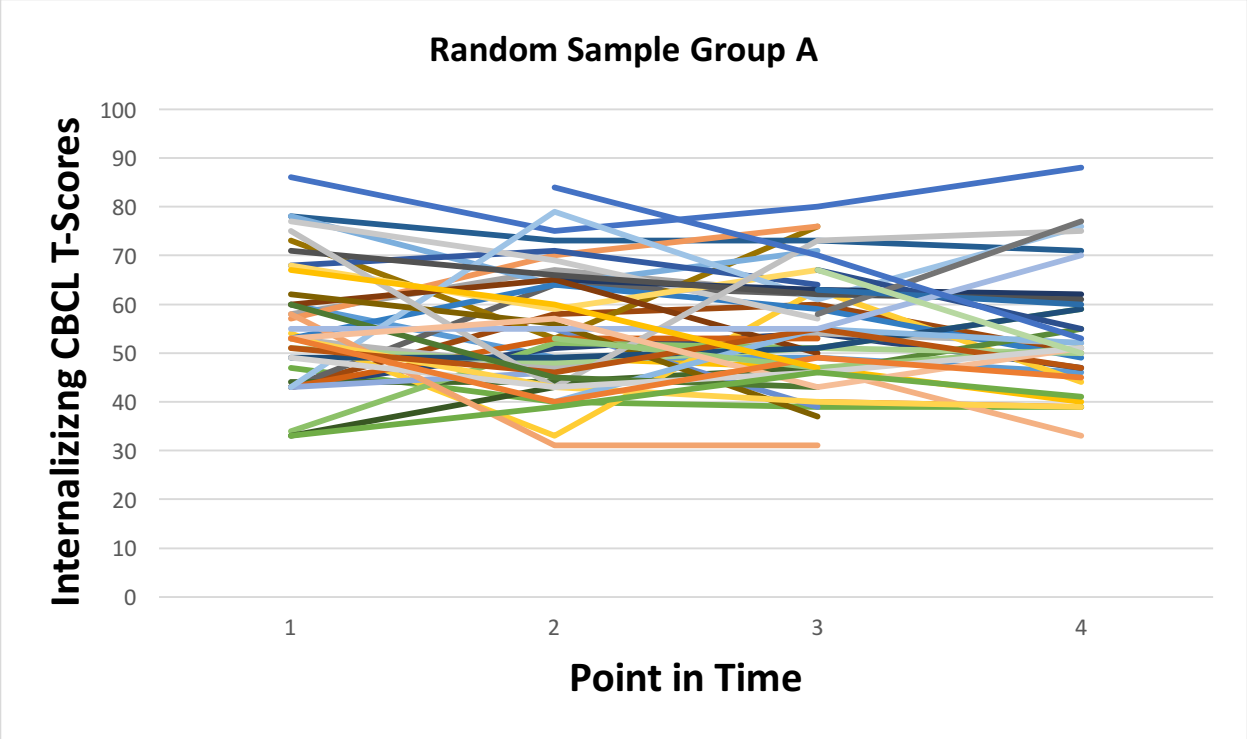
This study has several possible implications, both at the micro and the macro level of social work. Micro-level implications are those that are directly related to social work practice whereas macro implications are those related to both agency and federal policy (social welfare). There is a plethora of research on child maltreatment; however, the research is not comprehensive across different types of maltreatment. Most of the literature included in this study focuses on child maltreatment in general. However, there are clear distinctions of child maltreatment between the different types of child maltreatment. A child who manifests the impact of physical abuse may be very different from a child would manifest the impact of sexual abuse. Furthermore, child maltreatment does not only have immediate consequences; there are long-lasting effects of being maltreated as a child. If these abused children can be identified and appropriate interventions implemented, the impact of maltreatment may be minimized. This notion demonstrates why it is so important for practitioners to identify factors contributing to child behavior problems and to select appropriate interventions to improve child well-being.

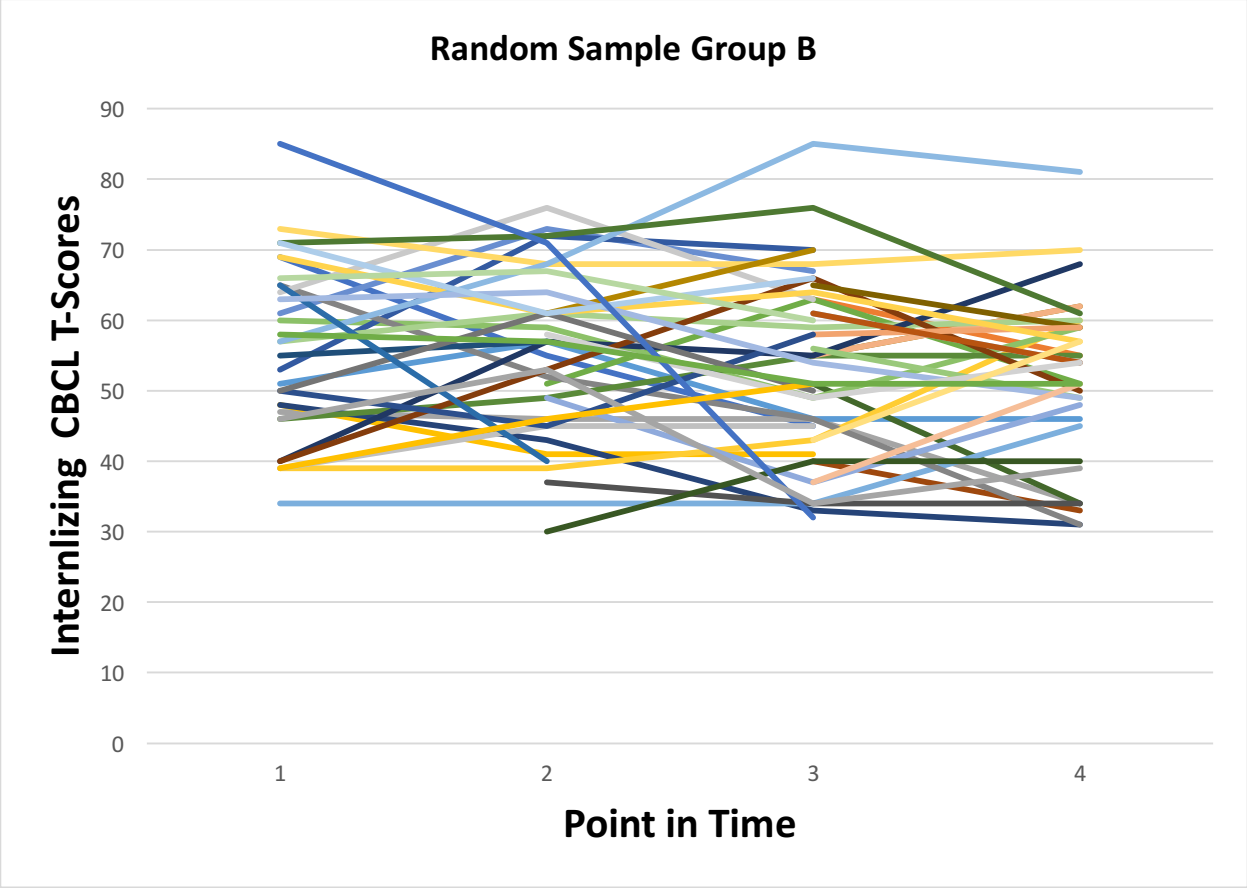
The knowledge that will be gained from this study examining the impact of child, caregiver, and environmental factors on the child behavior problems can be helpful in many ways. With this information, we are better able to understand what factors influence children's behavior. We will be able to learn that multiple-level factors have powerful influence on the child's behavior. Stable, nurturing caregivers and knowledgeable, supportive professionals can have a significant impact on children's development. Focusing on preventing child abuse and neglect, helping to strengthen families through trauma-informed systems and practices, and ensuring that children receive needed services are some of the most important efforts we can undertake.

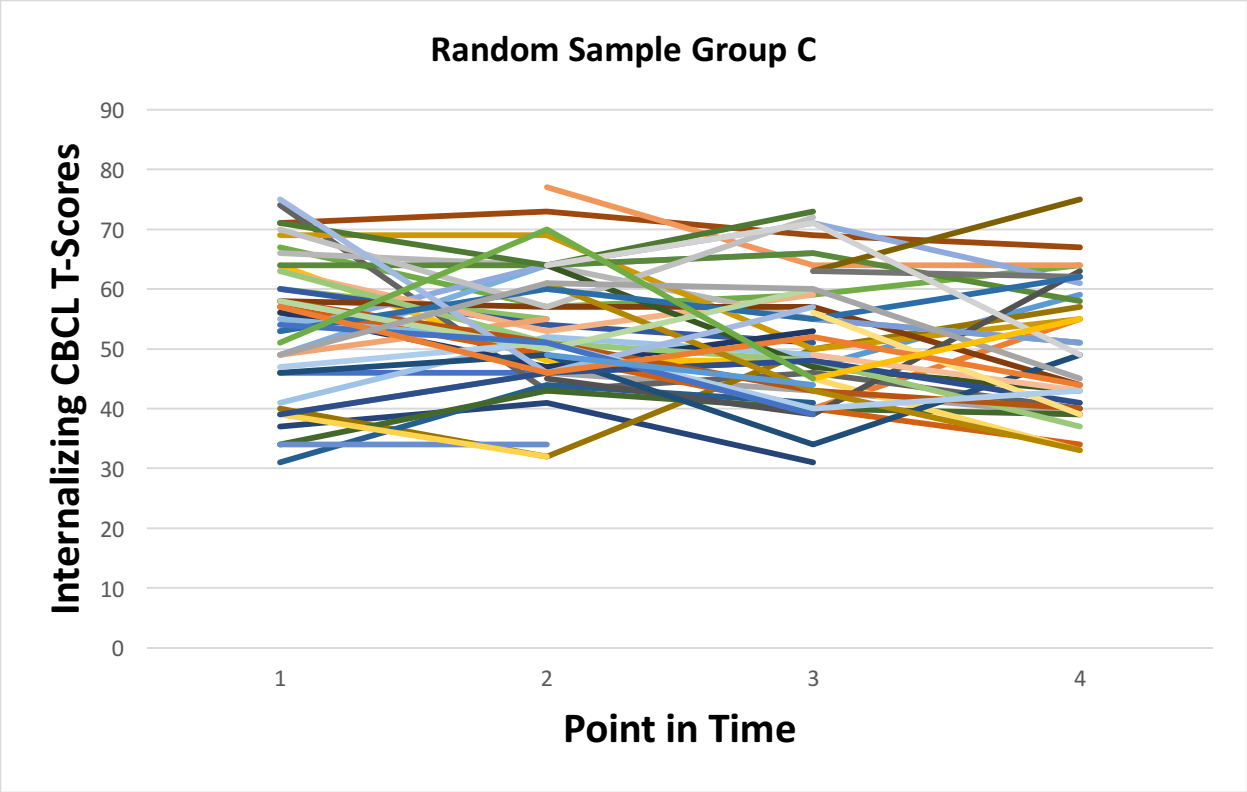
Conclusion

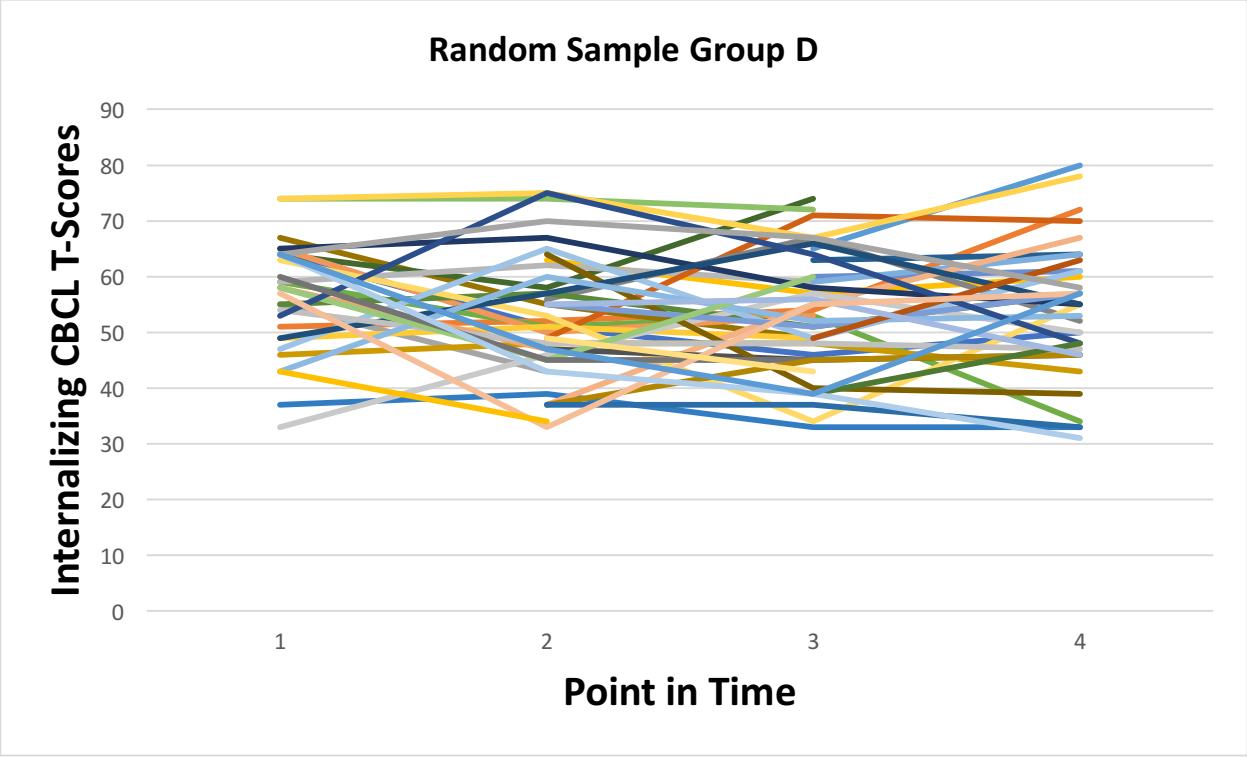
Identification of children most at risk of behavioral problems and other developmental challenges in this high-risk population may help practitioners provide problem-focused interventions in the child's early years to support their development and help avert later negative outcomes such as mental health problems, criminal involvement, and substance abuse. Specifically, identification and treatment of internalizing and externalizing behaviors in the high-normal, borderline, and clinical range, particularly for children referred for physical neglect and neglect, could prevent persistent or increasing internalizing and externalizing behavior problems and help children achieve optimal short and long-term outcomes.

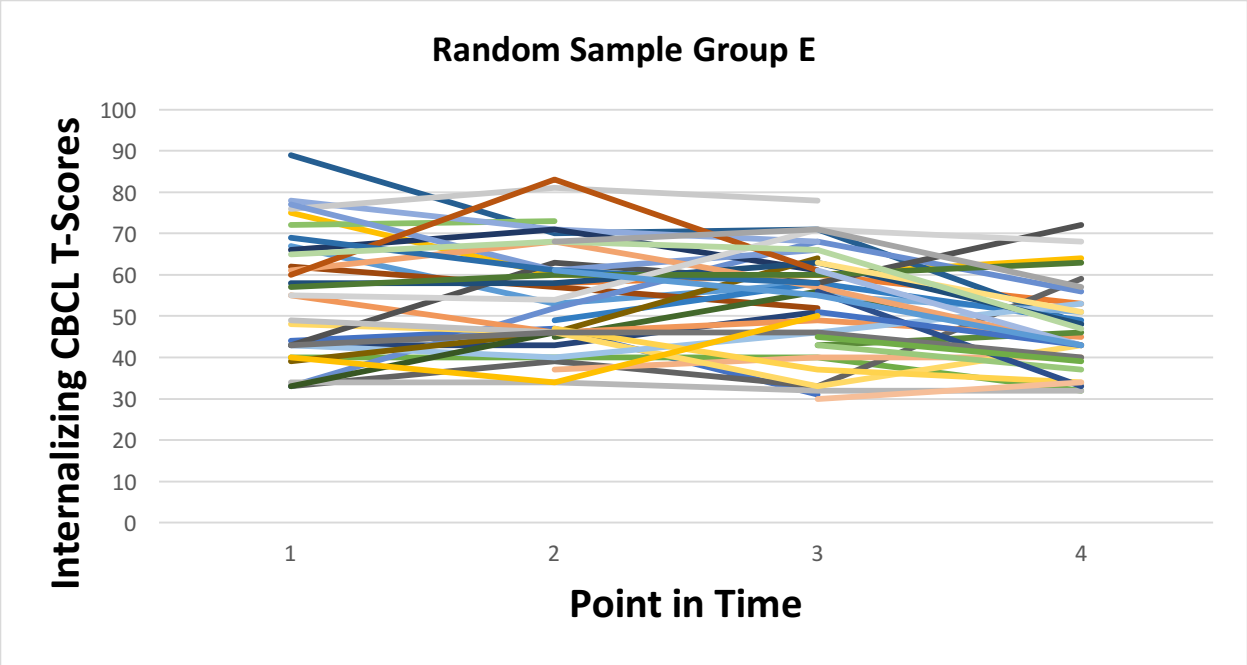
Appendix A. Random Sample of Individual Behavioral Trajectories






Random Sample Group C
Internalizing CBCL T-Scores
90
80
70
60
50
40
30
20
10
0
1
2
3
4
Point in Time


Random Sample Group D
Internalizing CBCL T-Scores
90
80
70
60
50
40
30
20
10
0
1
2
3
4
Point in Time


Random Sample Group E
Internalizing CBCL T-Scores
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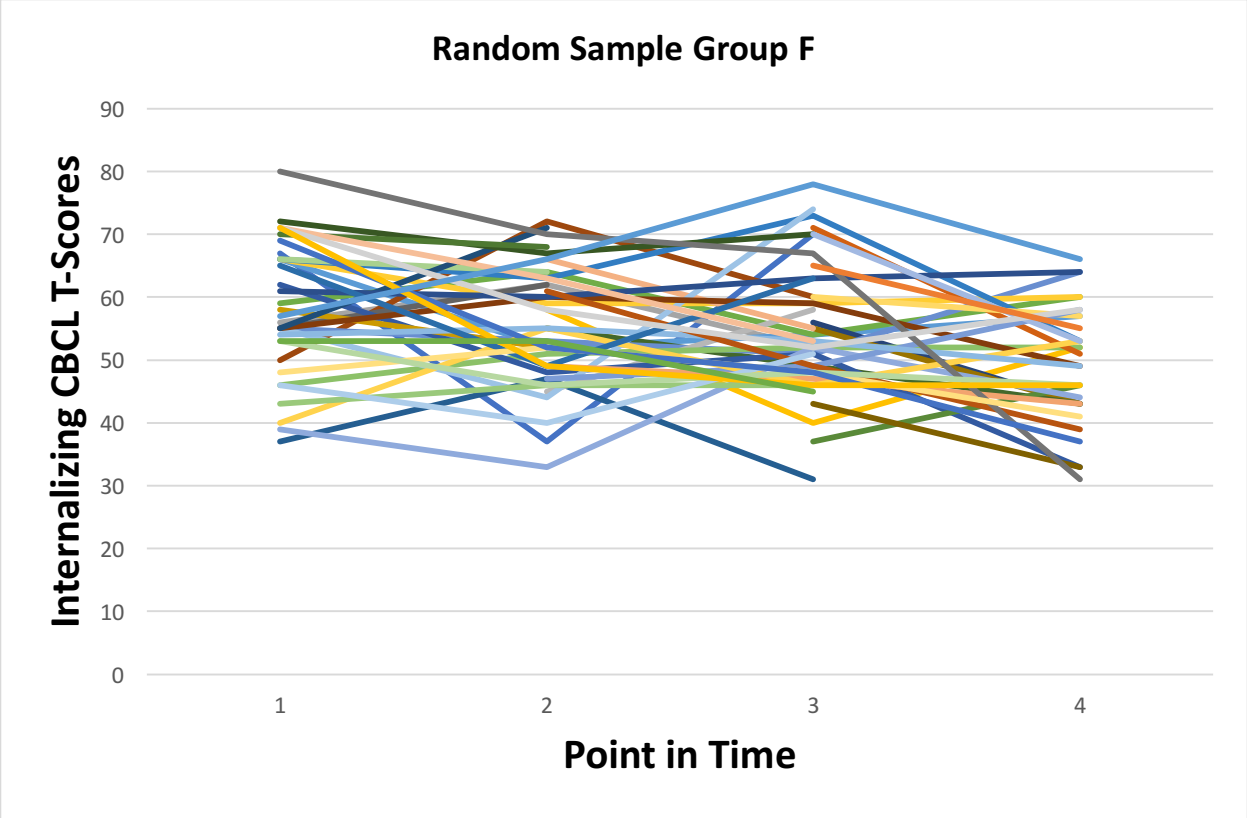
80
70
60
50
40
30
20
10
0
1
2
3
4
Point in Time


Random Sample Group F
Internalizing CBCL T-Scores
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80
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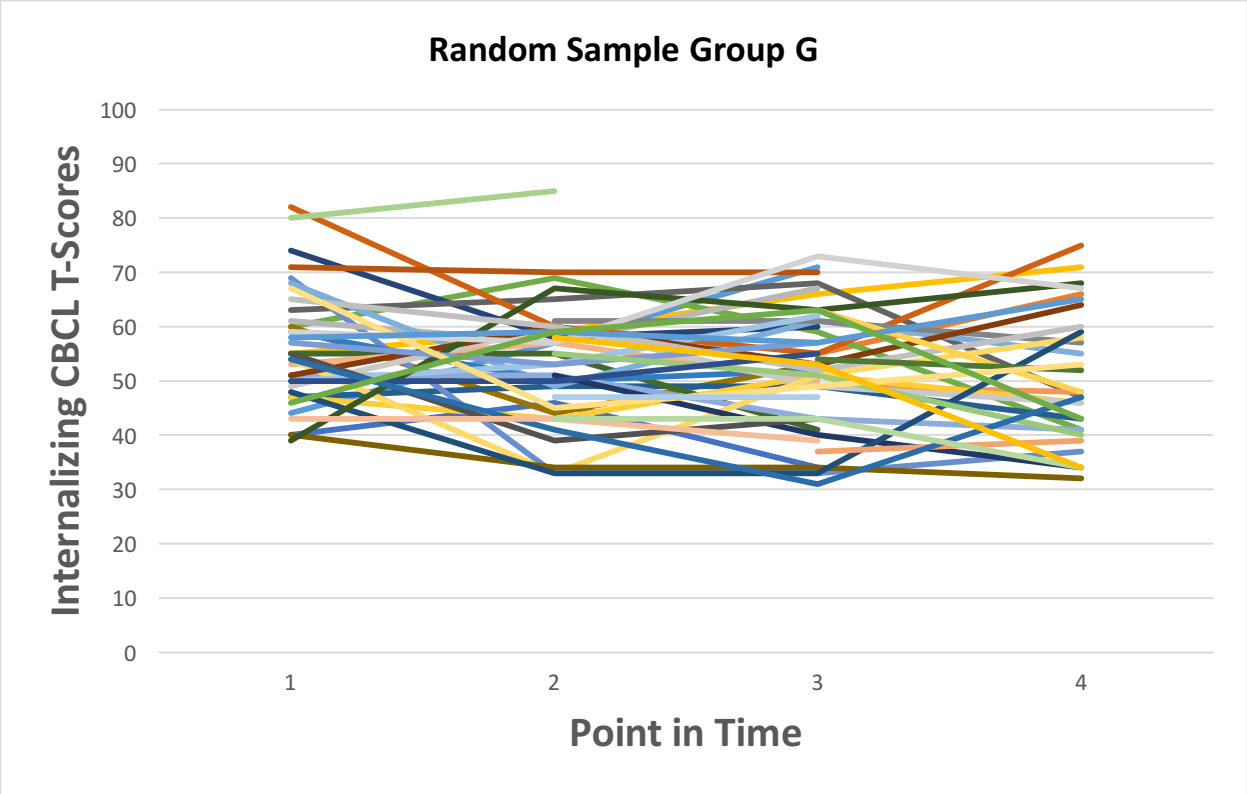
60
50
40
30
20
10
0
1
2
3
4
Point in Time


Random Sample Group G
Internalizing CBCL T-Scores
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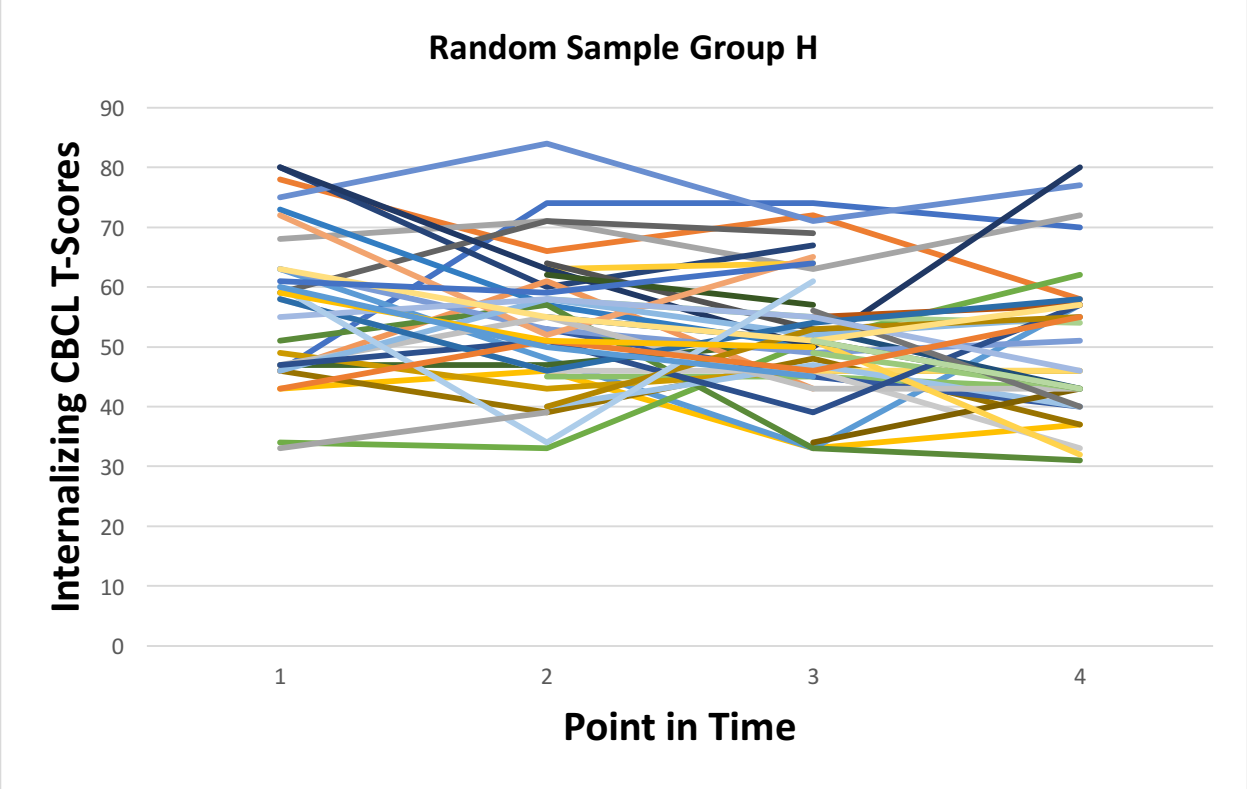
80
70
60
50
40
30
20
10
0
1
2
3
4
Point in Time


Random Sample Group H
Internalizing CBCL T-Scores
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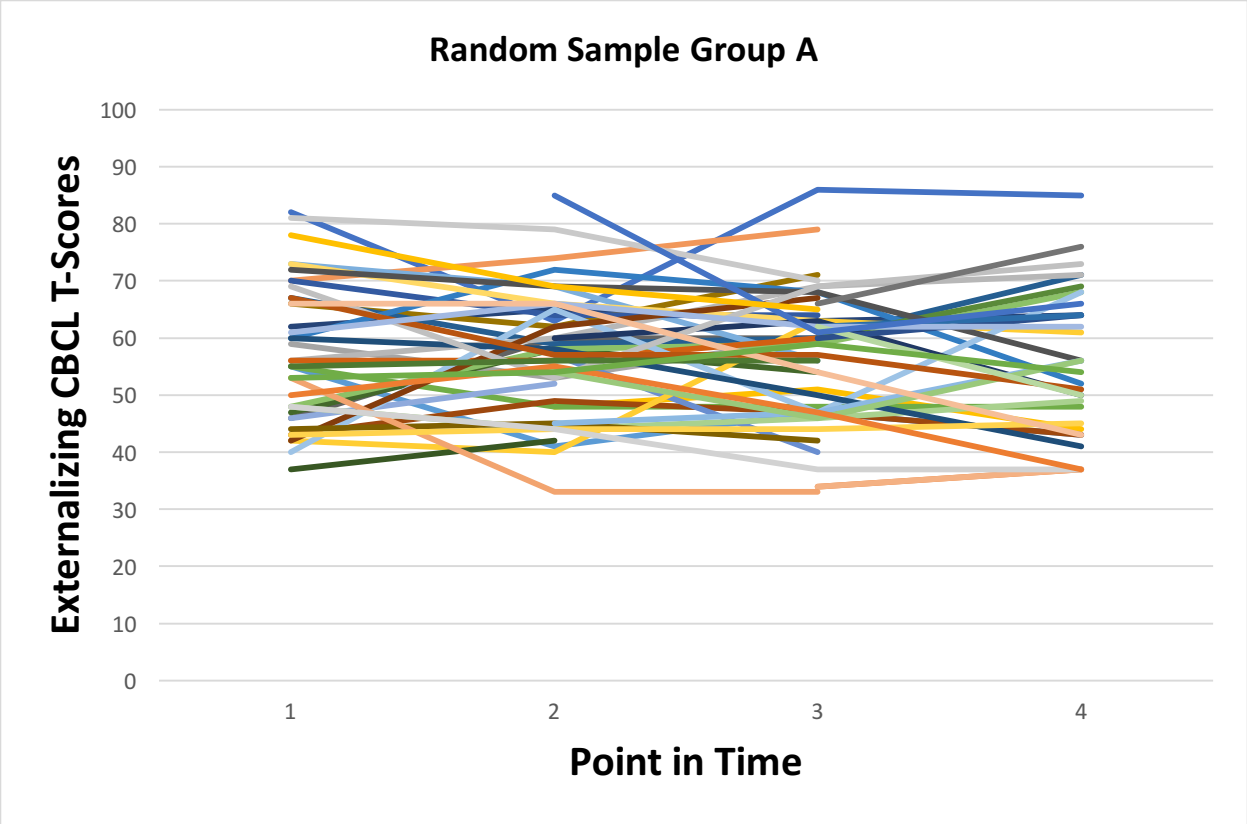
80
70
60
50
40
30
20
10
0
1
2
3
4
Point in Time


Random Sample Group A
Externalizing CBCL T-Scores
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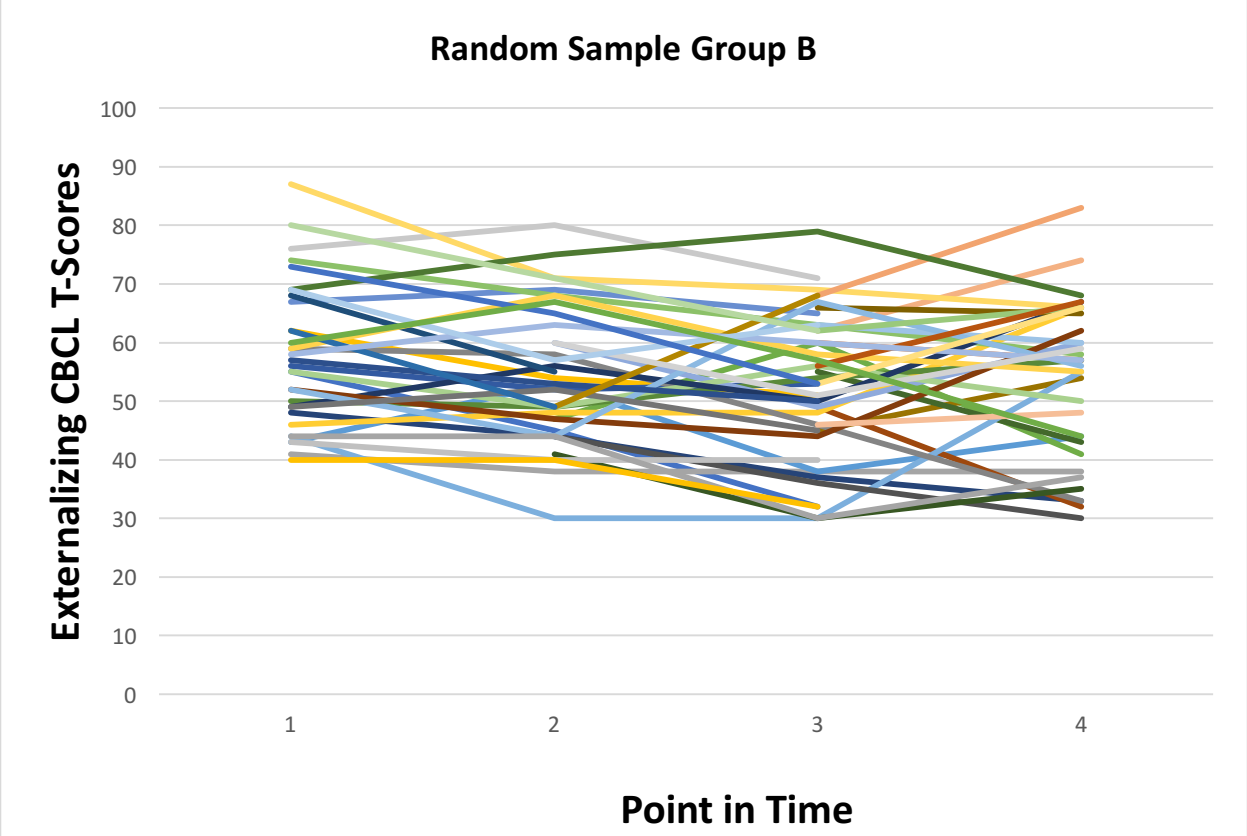
90
80
70
60
50
40
30
20
10
0
1
2
3
4
Point in Time


Random Sample Group B
Externalizing CBCL T-Scores
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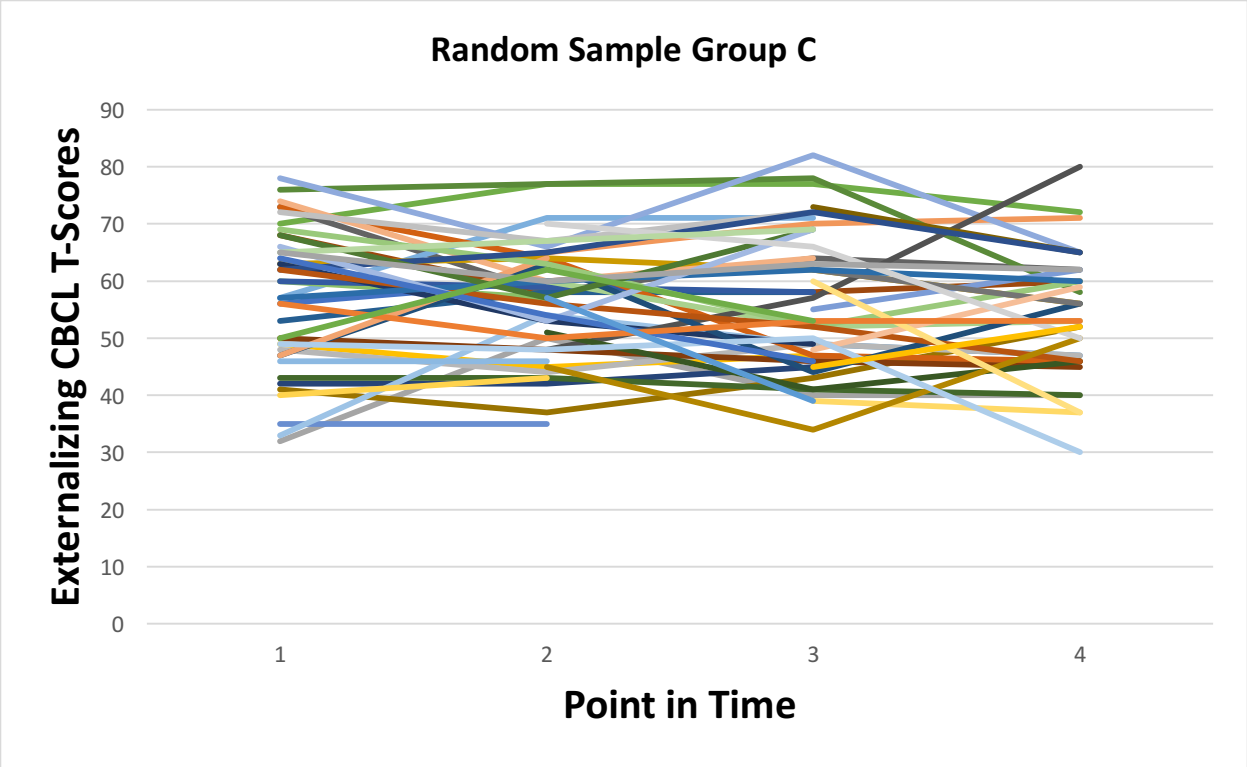
80
70
60
50
40
30
20
10
0
1
2
3
4
Point in Time


Random Sample Group C
Externalizing CBCL T-Scores
90
80
70
60
50
40
30
20
10
0
1
2
3
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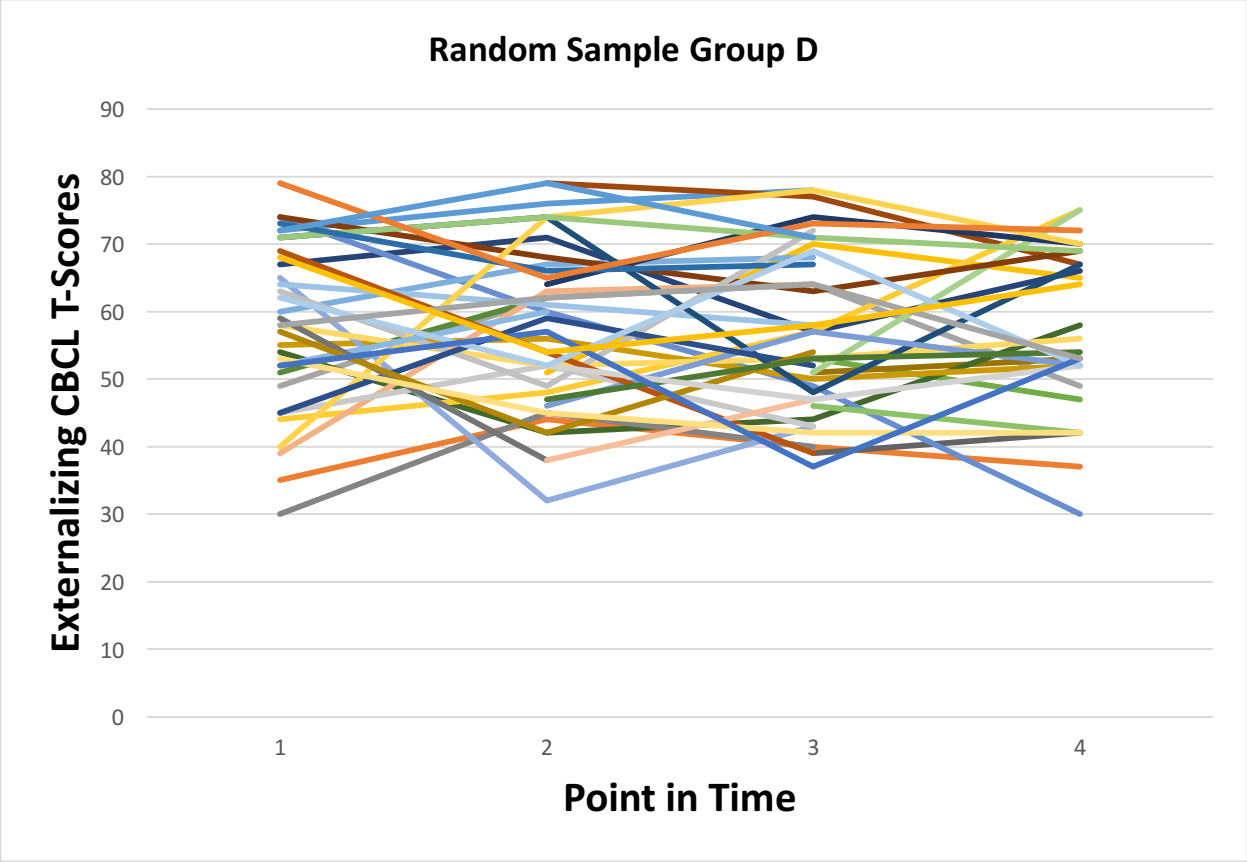
Point in Time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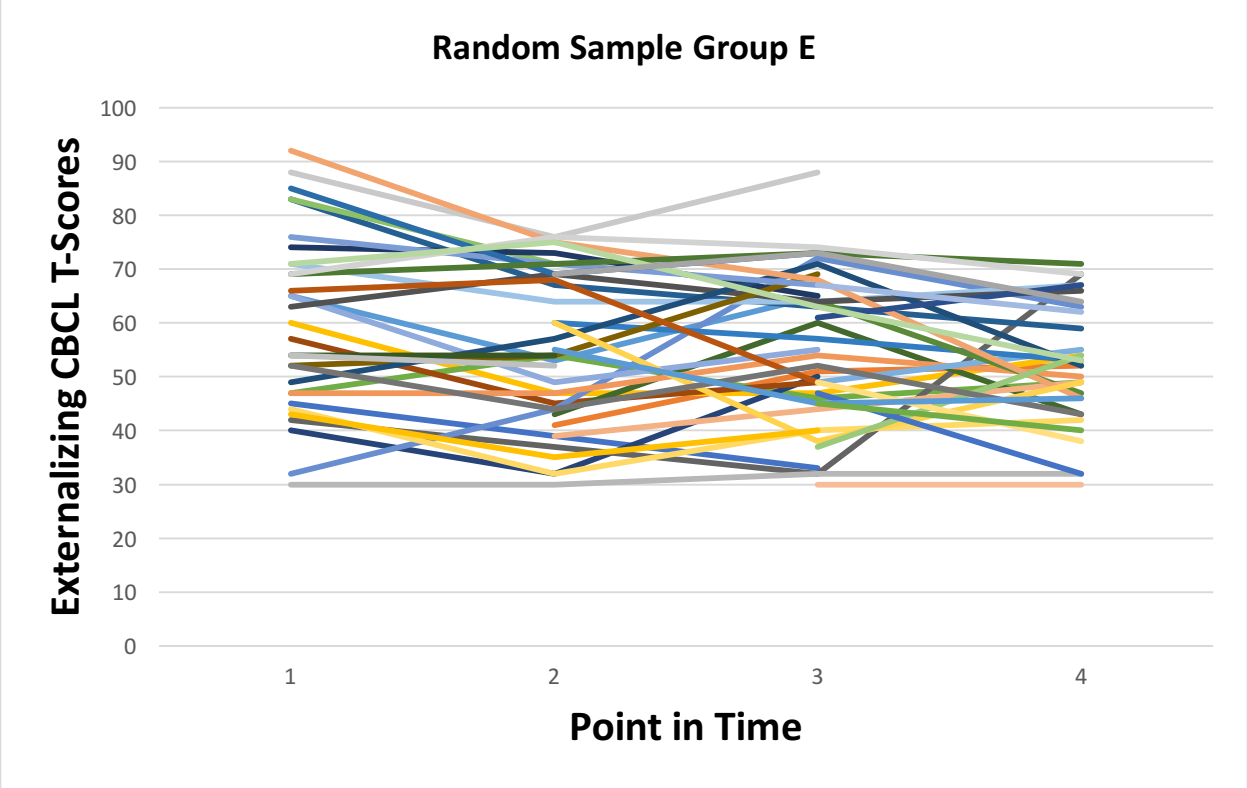
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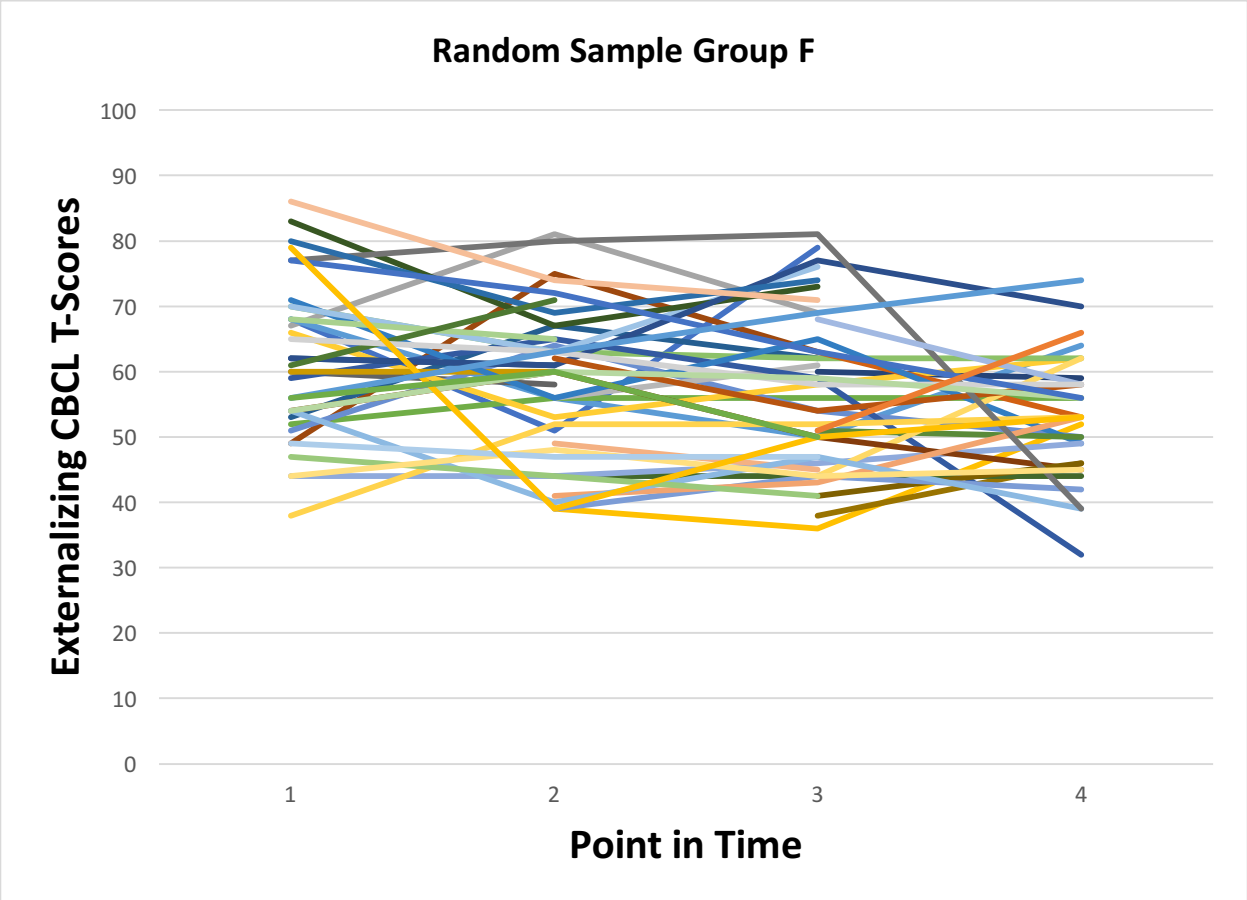
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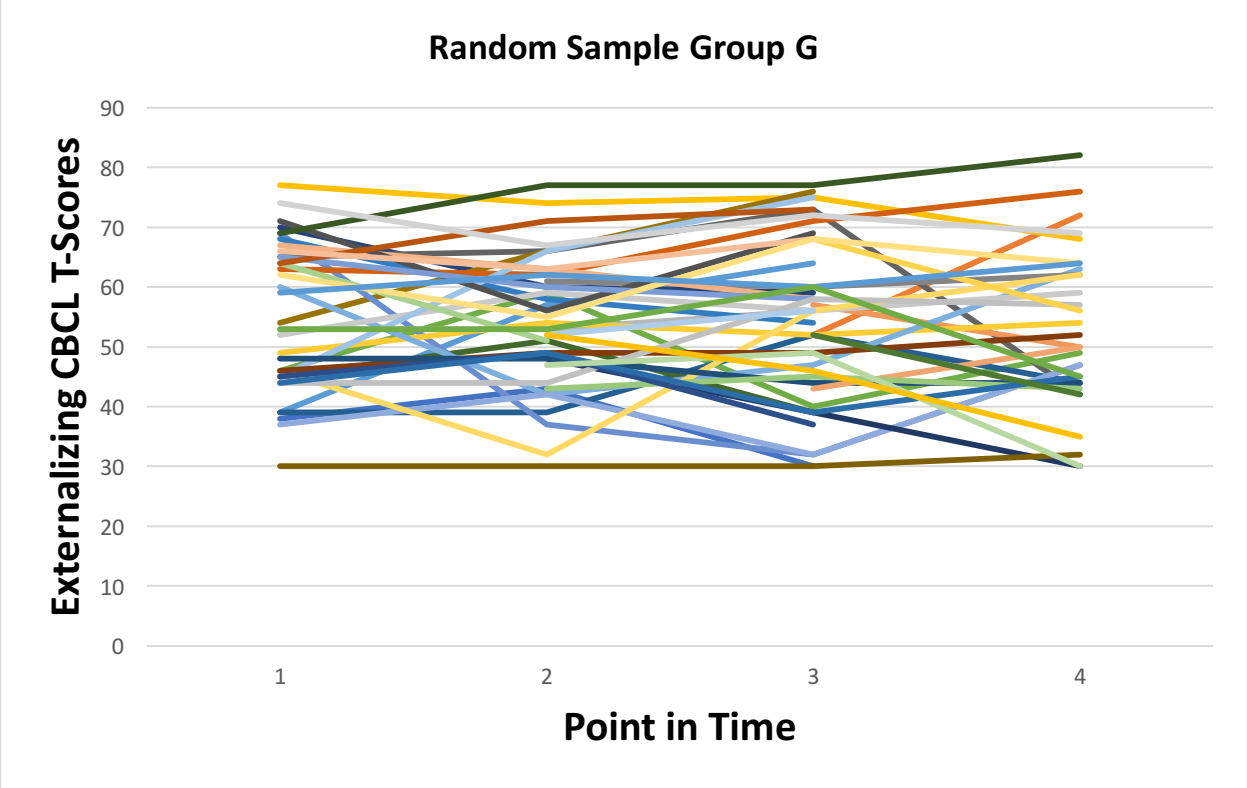
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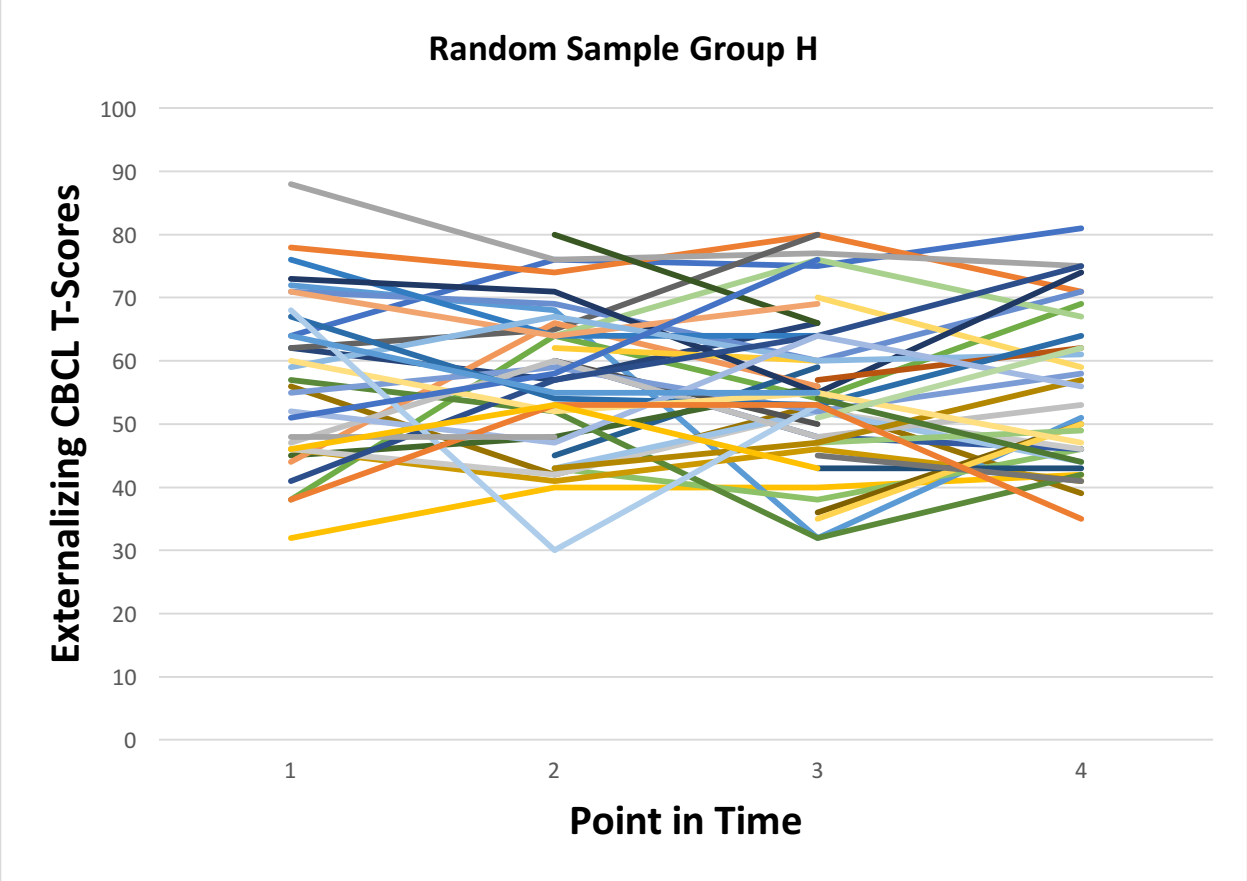
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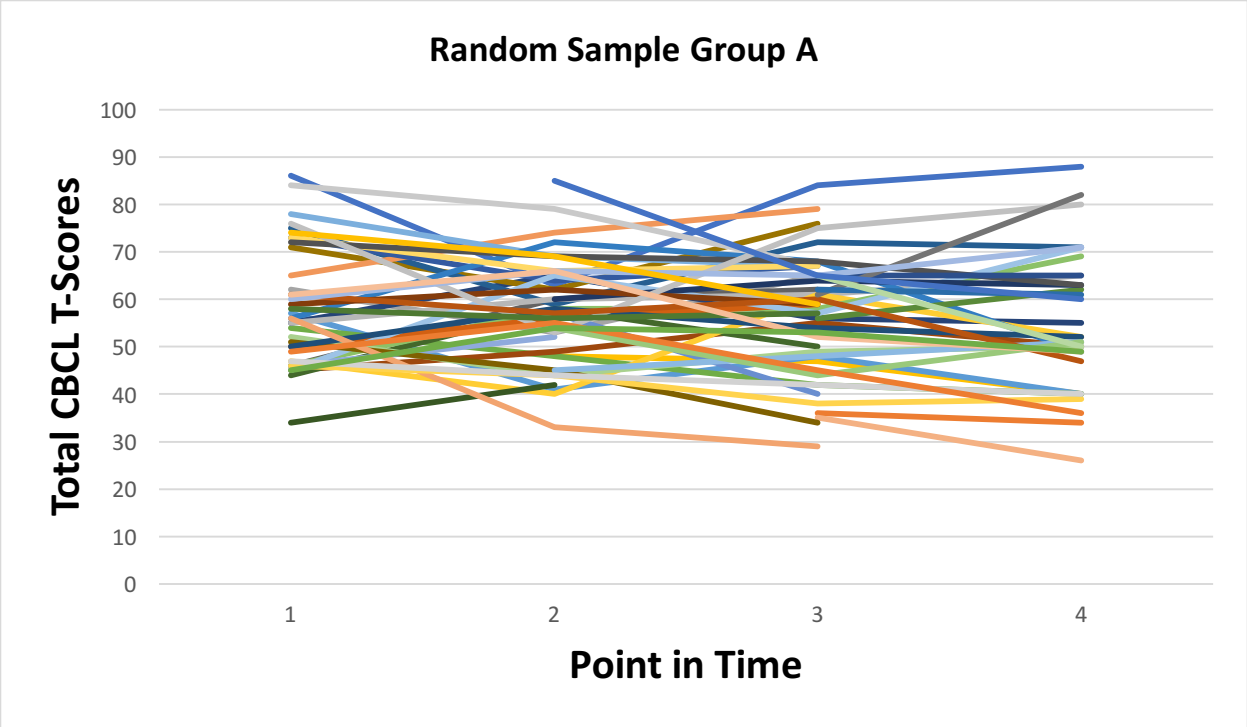
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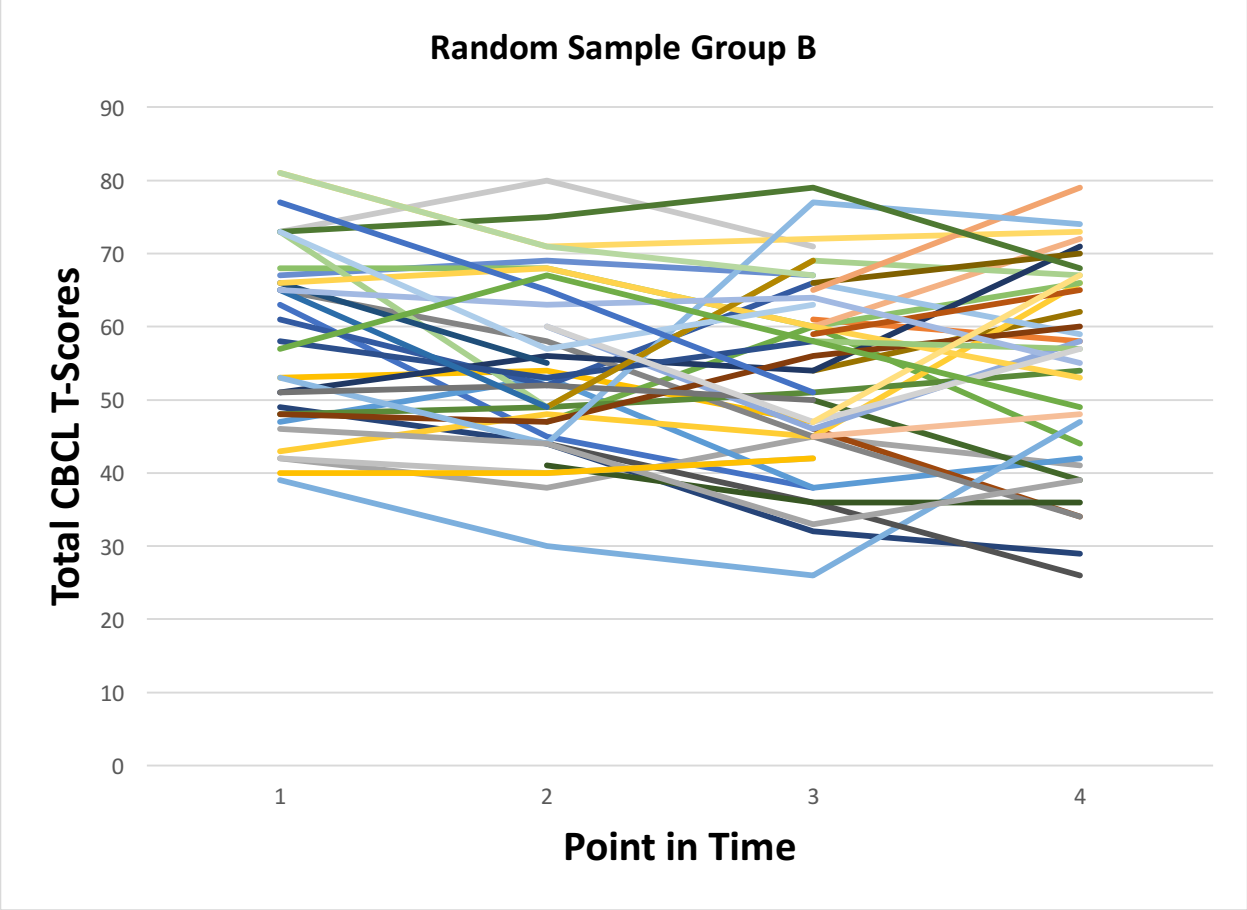
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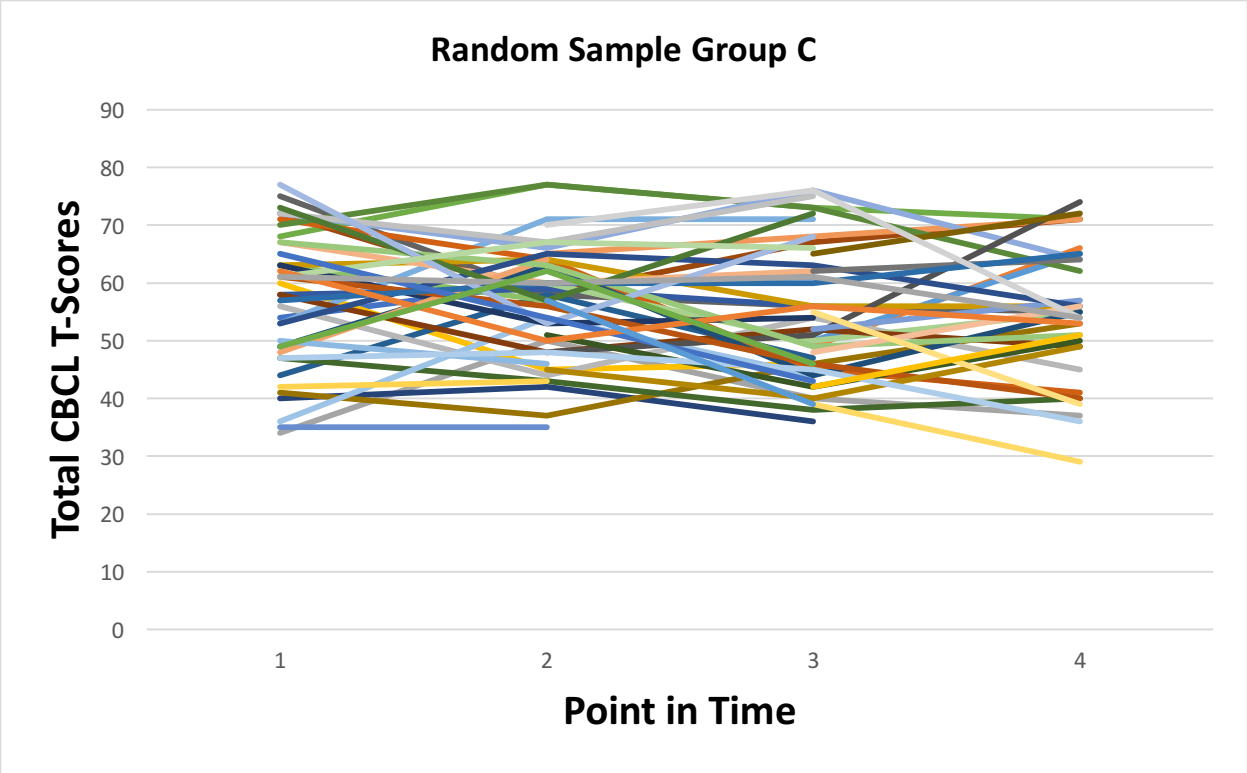
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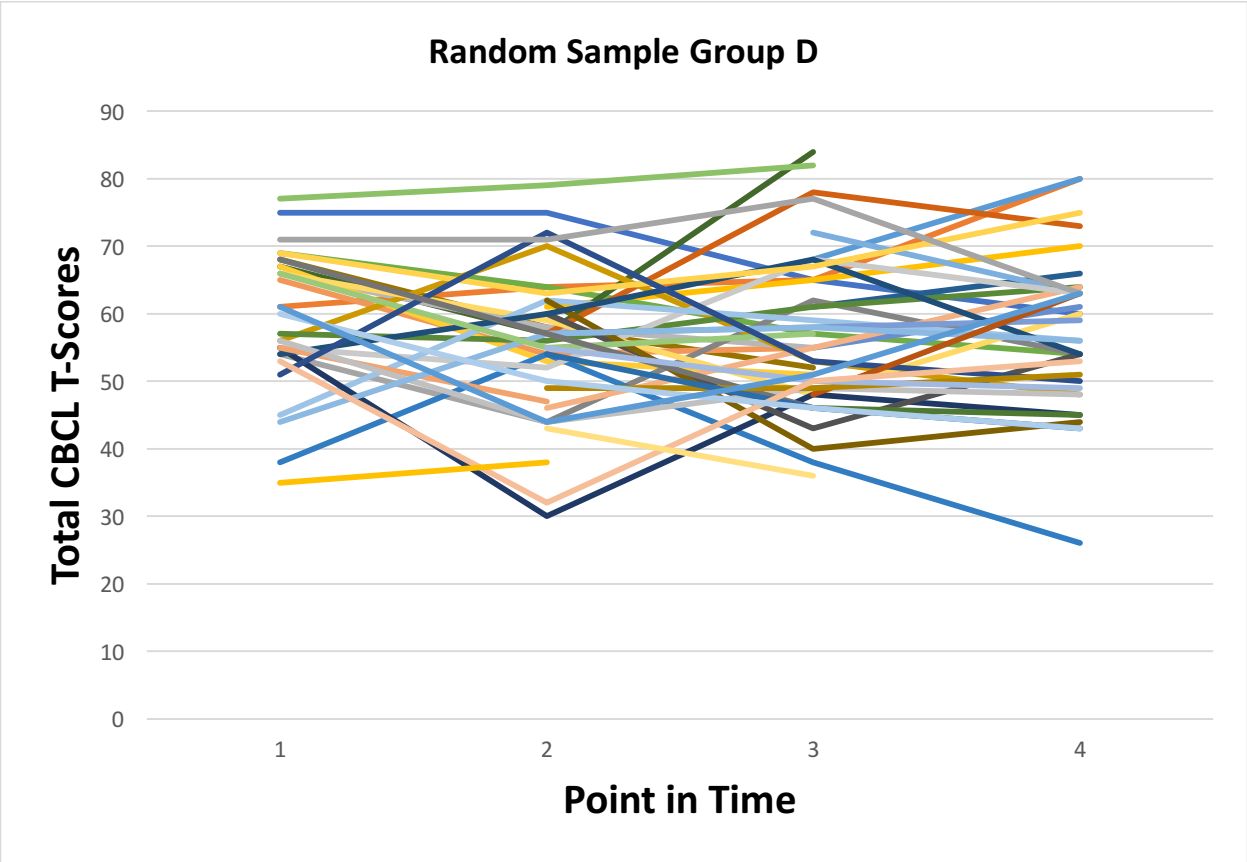
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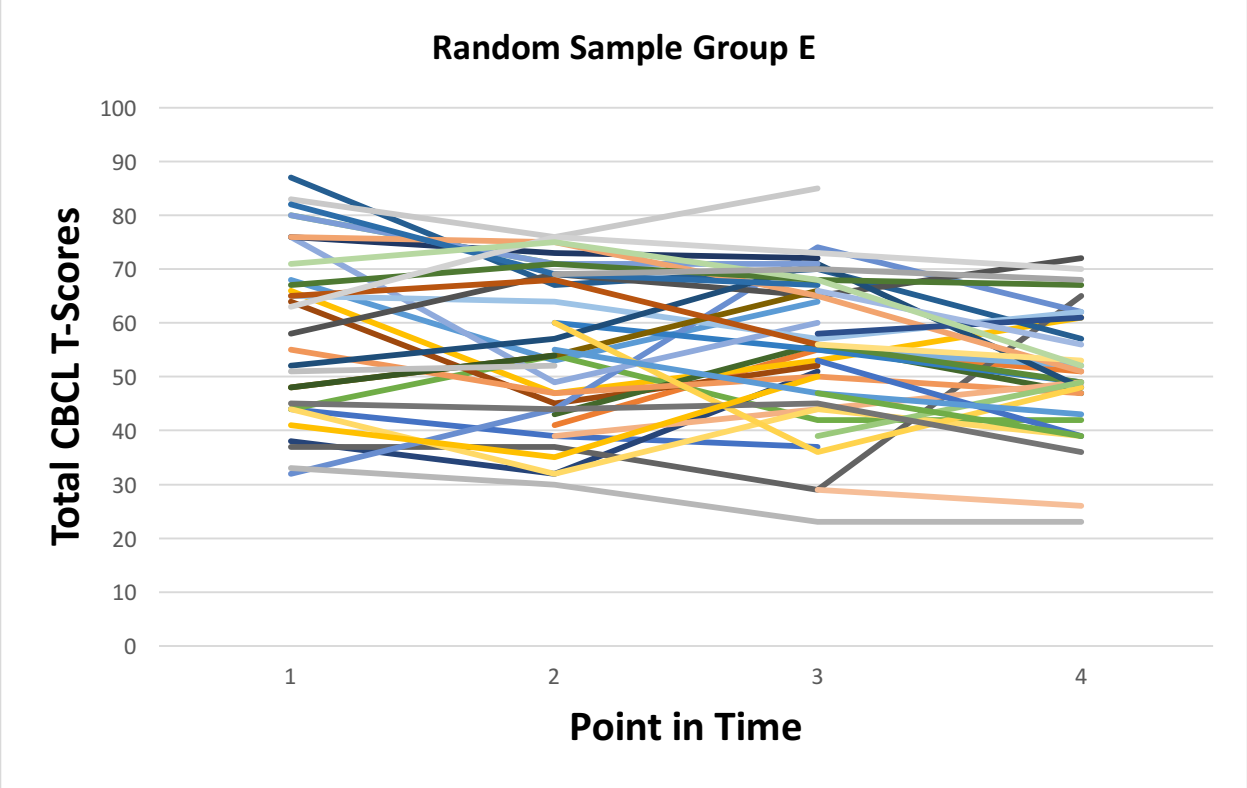
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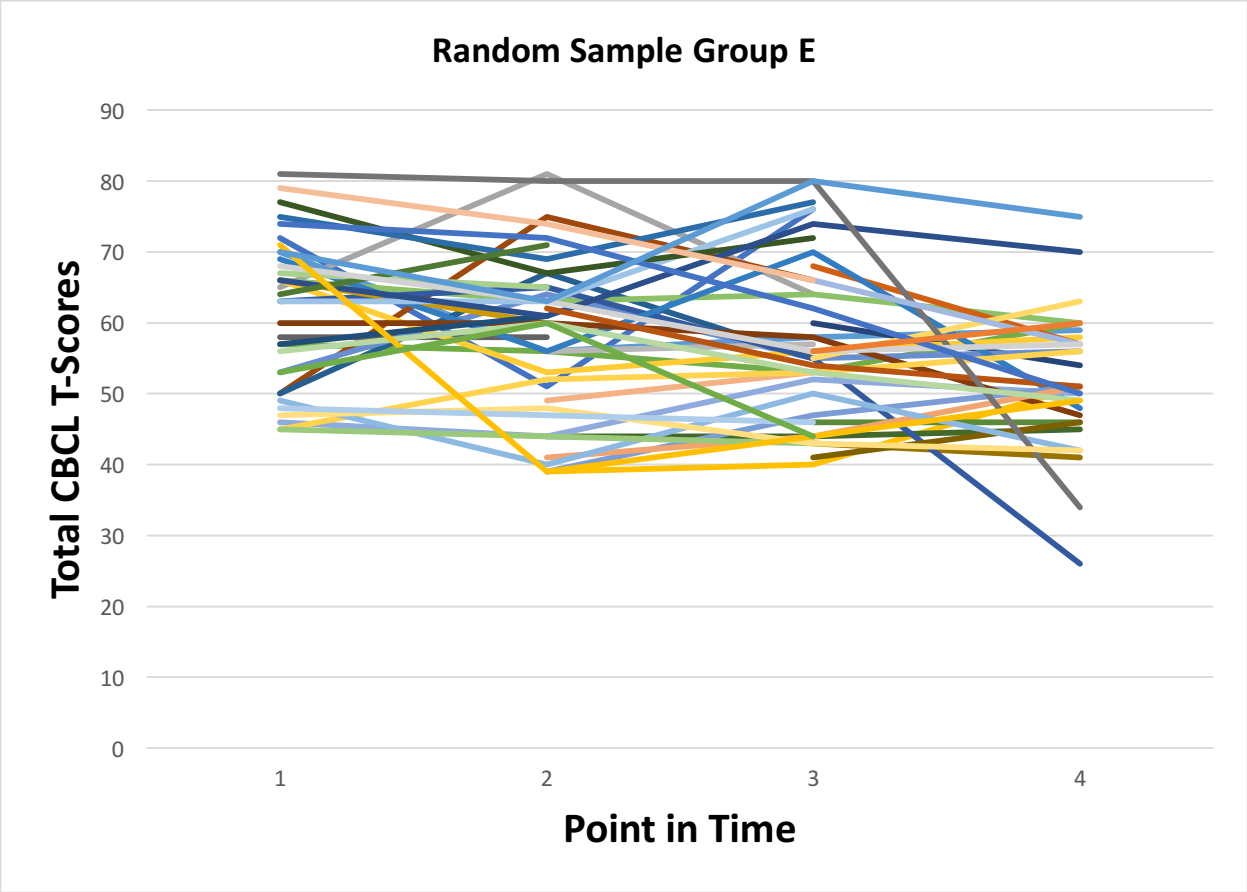
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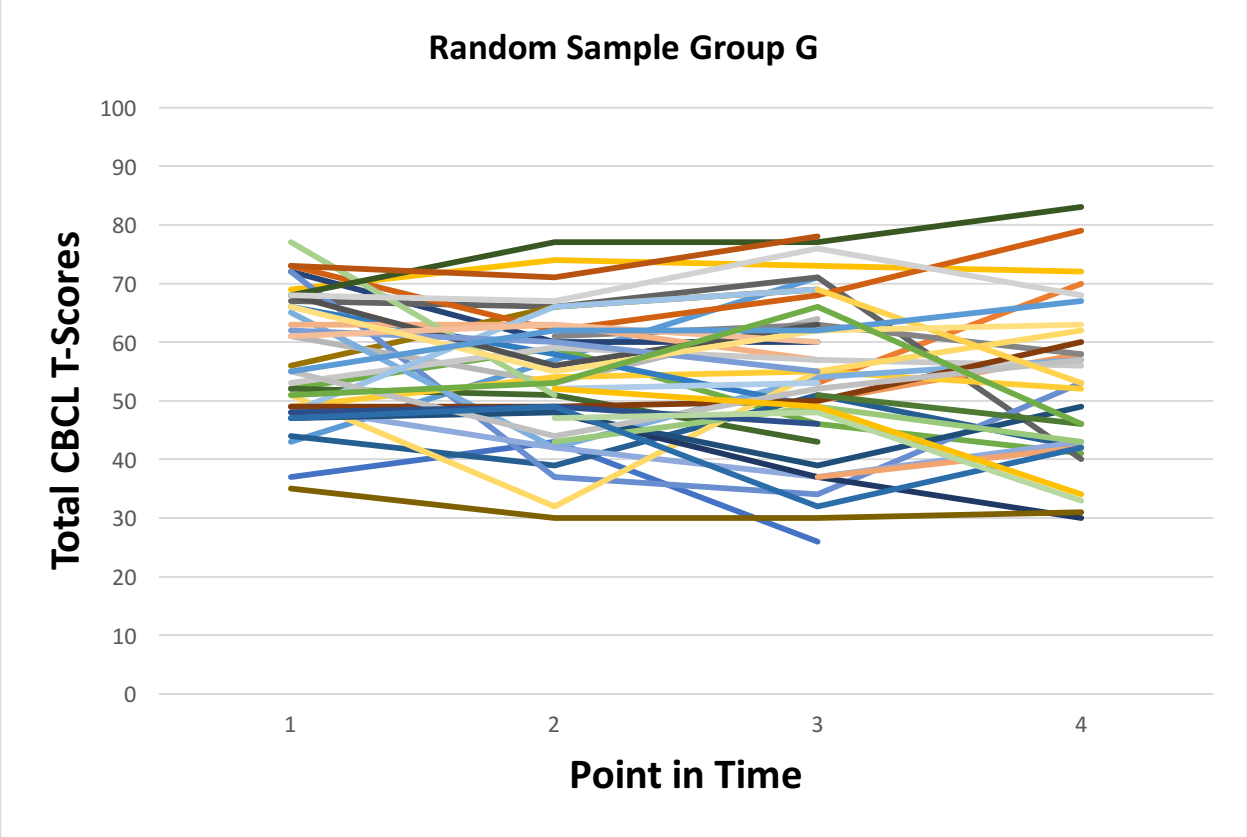
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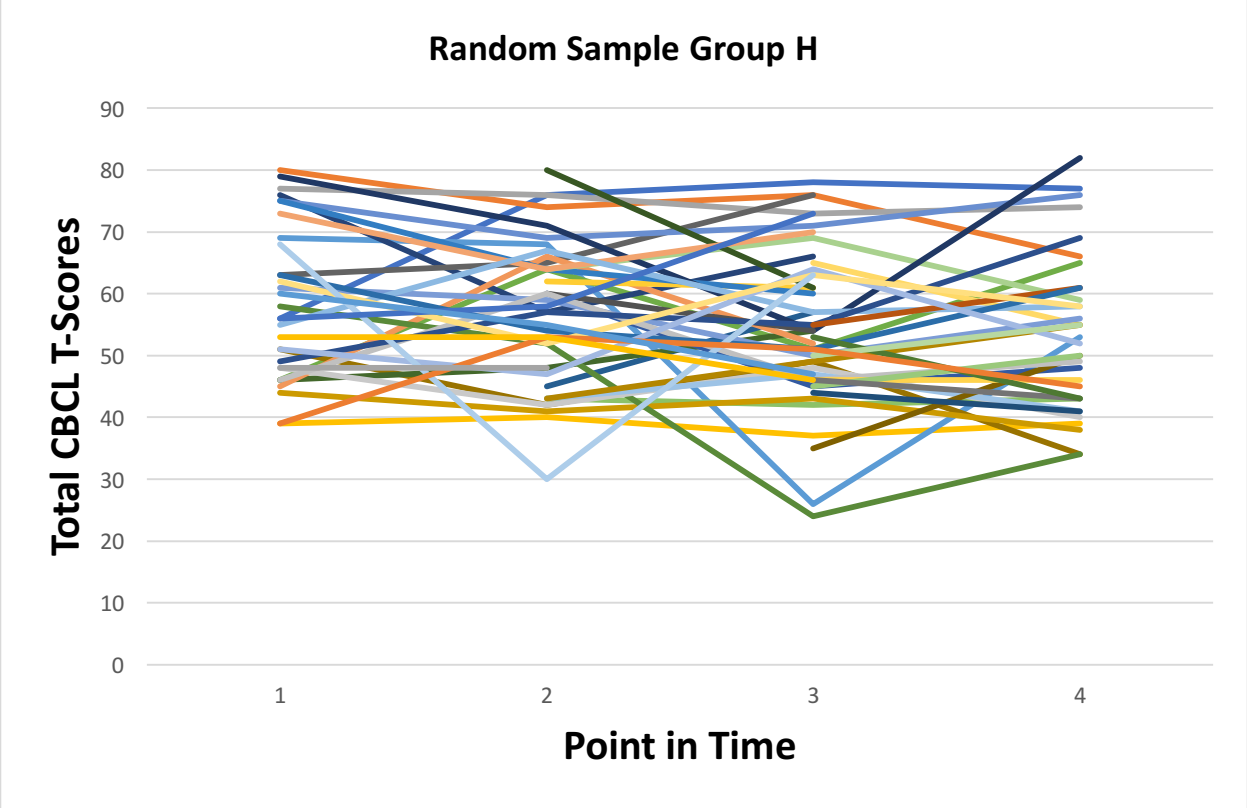
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